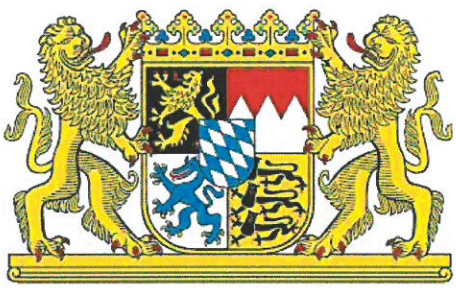
LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Technische Universität München

ZEUGNIS

DEGREE CERTIFICATE



Technische Universität München

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Technische Universität München

DIE LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN UND
DIE TECHNISCHE UNIVERSITÄT MÜNCHEN
VERLEIHEN MIT DIESER URKUNDE

HERRN

HONG XU

GEBOREN AM 5. APRIL 1993 IN ANQING

DEN AKADEMISCHEN GRAD

MASTER OF SCIENCE (M.Sc.)

NACHDEM ER DIE VORGESCHRIEBENEN WISSENSCHAFTLICHEN
STUDIENLEISTUNGEN NACHGEWIESEN UND DIE
MASTERPRÜFUNG AN DER
LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN UND DER
TECHNISCHEN UNIVERSITÄT MÜNCHEN ERFOLGREICH ABGELEGT
HAT. DIE EINZELERGEBNISSE DER PRÜFUNG SIND IN EINEM
GESONDERTEN ZEUGNIS ZUSAMMENGESTELLT.

MÜNCHEN, 29. SEPTEMBER 2016

PROF. DR. RER. POL. BERND HUBER
PRÄSIDENT

PROF. DR. DR. H.C. MULT. WOLFGANG A. HERRMANN
PRÄSIDENT

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Technische Universität München

THE LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN AND THE
TECHNISCHE UNIVERSITÄT MÜNCHEN
CONFER WITH THIS CERTIFICATE

ON

HONG XU
BORN ON APRIL 5, 1993 IN ANQING

THE ACADEMIC DEGREE OF

MASTER OF SCIENCE (M.Sc)

ON FULFILLMENT OF THE REQUIRED COURSE OF STUDY AND SUCCESSFUL COMPLETION OF THE EXAMINATIONS FOR THE ABOVE DEGREE AT THE LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN AND THE TECHNISCHE UNIVERSITÄT MÜNCHEN. THE INDIVIDUAL MARKS OBTAINED IN EACH SUBJECT ARE LISTED IN A SEPARATE DOCUMENT.

MUNICH, SEPTEMBER 29, 2016
(SIGNED BY)

PROF. DR. RER. POL. BERND HUBER
PRÄSIDENT

PROF. DR. DR. H.C. MULT. WOLFGANG A. HERRMANN
PRÄSIDENT

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Technische Universität München

LA LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN ET LA
TECHNISCHE UNIVERSITÄT MÜNCHEN
CONFÈRENT PAR LE PRÉSENT DIPLÔME À

MONSIEUR

HONG XU
NÉ LE 5 AVRIL, 1993 Á ANQING

LE TITRE UNIVERSITAIRE DE

MASTER OF SCIENCE (M.Sc)

APRÈS VALIDATION DES CONNAISSANCES SCIENTIFIQUES
REQUISES ET RÉUSSITE AUX ÉPREUVES SANCTIONNANT CE
DIPLÔME À LA LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN
ET LA TECHNISCHE UNIVERSITÄT MÜNCHEN. LES
RÉSULTATS OBTENUS POUR CHAQUE ÉPREUVE SONT
PRÉSENTÉS SÉPARÉMENT DANS UN RELEVÉ DE NOTES.

MUNICH, LE 29 SEPTEMBRE 2016
(SIGNÉ)

PROF. DR. RER. POL. BERND HUBER
PRÄSIDENT

PROF. DR. DR. H.C. MULT. WOLFGANG A. HERRMANN
PRÄSIDENT

Technische Universität München

LUDWIG-MAXIMILIANS-UNIVERSITÄT

UND TECHNISCHE UNIVERSITÄT

MÜNCHEN

Zeugnis

Degree Certificate

über die Masterprüfung im Studiengang
Geomaterialien und Geochemie

concerning the examination leading to the Master's Degree in
Geomaterials and Geochemistry

Herr / Mr.

Hong Xu

geboren am 5. April 1993

born on April 5, 1993

in Anqing

hat die Masterprüfung am 29. September 2016 erfolgreich abgeschlossen
mit dem Prädikat

gut

has completed all requirements for the Master of Science Degree on September 29, 2016
with the rating

good

Die Einzelergebnisse der Prüfung sind dem nachfolgenden Auszug
aus der Prüfungsniederschrift zu entnehmen.

The candidate's individual grades for each subject are shown
in the following excerpt from the examination record.

München,
29. September 2016 / September 29, 2016

Der Vorsitzende des Prüfungsausschusses
Masterstudiengang Geomaterialien und Geochemie

Chairperson of the Master Examination Board of the
Master Program in Geomaterials and Geochemistry

Prof. Dr. Peter Gille

Herr Xu hat in der Masterprüfung im Studiengang Geomaterialien und Geochemie folgende Ergebnisse erzielt:
Mr. Xu has achieved the following results in the Final Examination for the Master Degree in Geomaterials and Geochemistry:

Prüfungsfächer/Module	Compulsory subjects/Modules	Semester Semester	Note Grade	Gewicht Weight
A. Semester 1 + 2 *Siehe Anlage vom 17 September 2015 Universität Rennes I, Frankreich*	**A. Semester 1 + 2** *See attached document from September 17, 2015, University of Rennes I, France*	WiSe 14/15 SoSe 15	2,31	60
B. Semester 3+4 *Siehe Anlage vom 18. Dezember 2015, Ludwig-Maximilians-Universität München, Deutschland*	**B. Semester 3+4** *See attached document from December 18, 2015, Ludwig-Maximilians-Universität München, Germany*	WiSe 15/16 SoSe 16	1,70	30
C. Master-Arbeit *Titel: Structure and Properties of Thermoresponsive Diplock Copolymers Embedded with Metal Oxide Nanoparticles* *Ausgeführt unter der gemeinsamen Anleitung von Prof. Peter Müller-Buschbaum, Technische Universität München, Deutschland und Prof. Wolfgang Schmahl, Ludwig-Maximilians-Universität München, Deutschland* *mit der Note 1,3*	**C. Master's Thesis** *Title: Structure and Properties of Thermoresponsive Diplock Copolymers Embedded with Metal Oxide Nanoparticles* *Prepared under the joint supervision of Prof. Peter Müller-Buschbaum, Technische Universität München, Germany and Prof. Wolfgang Schmahl, Maximilians-Universität München, Germany* *with the grade of 1.3*	SoSe 16	1,30	30

Gesamtnote: 1,78 **Prädikat: "gut"** **ECTS-Grade: B**

Overall Average: 1.78 **Rating: "good"**

Gewicht = Credits nach dem European Credit Transfer System (ECTS) Weight = credits according to the European Credit Transfer System (ECTS)

München, Munich
29. September 2016 / September 29, 2016

Zur Beglaubigung: Prüfungsamt Naturwissenschaften Innenstadt
Ludwig-Maximilians-Universität München
Certified by the Examination Office Natural Sciences
Ludwig-Maximilians-Universität München

Leiterin des Prüfungsamtes
Director of the Examination Office

Rebecca Ogbonna

LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Erläuterungen

1. Die Urteile über die einzelnen Prüfungsleistungen der Kandidaten werden von dem jeweiligen Prüfer durch folgende Noten ausgedrückt:
   Note 1 "sehr gut"
   Note 2 "gut"
   Note 3 "befriedigend"
   Note 4 "ausreichend"
   Note 5 "nicht ausreichend".

2. Zur differenzierteren Bewertung der Leistungen können die Notenziffern um 0,3 erniedrigt oder erhöht werden. Die Noten 0,7; 4,3; 4,7 und 5,3 sind ausgeschlossen.

3. Die Modulnote errechnet sich aus dem arithmetischen Mittel der Noten der für das Modul erforderlichen Lehrveranstaltungen.

4. Die Gesamtnote für die Module errechnet sich aus dem arithmetischen Mittel der einzelnen Modulnoten, wobei die Module 1 bis 5 und 8 einfach und die Module 6 und 7 vierfach gewichtet werden. Bei der Berechnung werden zwei Nachkommastellen ohne Rundung berücksichtigt.

5. Die Gesamtnote der Masterprüfung berechnet sich aus dem arithmetischen Mittel der dreifach gewichteten Gesamtmodulnote und der Note für die Masterarbeit. Bei der Berechnung werden zwei Nachkommastellen ohne Rundung berücksichtigt.

6. Die Gesamtnote lautet bei einem Durchschnitt
   von 1,00 bis 1,59 "sehr gut"
   von 1,60 bis 2,59 "gut"
   von 2,60 bis 3,59 "befriedigend"
   von 3,60 bis 4,00 "ausreichend"

7. Bei der Gesamtnote für die Masterprüfung von 1,00 zu 1,15 wird das Prädikat „mit Auszeichnung bestanden" verliehen.

8. Es gilt die zugrunde liegende Prüfungsordnung für den gemeinsamen Master- Studiengang „Geomaterialien und Geochemie" der Ludwig-Maximilians-Universität München und der Technischen Universität München vom 30. Oktober 2006.

Explanation

1. The candidate´s grades in each individual examination are expressed by the examiner according to the following scale:
   grade 1 "very good"
   grade 2 "good"
   grade 3 "satisfactory"
   grade 4 "sufficient"
   grade 5 "fail"

2. For the purpose of a more differentiated assessment, the above grades may be raised or lowered by 0.3. The grades 0.7, 4.3, 4.7 and 5.3 cannot be used.

3. The grade for each Module is calculated as the arithmetic mean of the individual grades of the required Module courses.

4. An overall grade of the Modules is calculated as the arithmetic mean of the grades of the single Modules, whereby the weighting factor of the Modules 1 to 5 and 8 is one and of Modules 6 and 7 is four.

5. The overall grade of the Master examination is calculated as the arithmetic mean of the threefold weighted overall grade of the Modules plus the grade of the Master thesis. Only the first two decimals are taken into account without rounding.

6. The overall grade is expressed according to the following
   1.00 to 1.59 "very good"
   1.60 to 2.59 "good"
   2.60 to 3.59 "satisfactory"
   3.60 to 4.00 "sufficient".

7. The predicate "passed with distinction" will be awarded for an overall grade between 1.00 and 1.15.

8. It is based on the examination regulation of the master's degree program "Geomaterials and Geochemistry" of the Ludwig- Maximilians-Universität München and the Technische Universität München of October 30, 2006.

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Technische Universität München

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. HOLDER OF THE QUALIFICATION

1.1 Family Name, First Name

Xu, Hong

1.2 Date, Place, Country of Birth

April 5, 1993 in Anqing

1.3 Student ID Number or Code

11423906

2. QUALIFICATION

2.1 Name of Qualification (full, abbreviated; in original language)

Master of Science - M.Sc.

Title Conferred (full, abbreviated; in original language)
Master of Science - M.Sc.

2.2 Main Field(s) of Study

Geomaterials and Geochemistry

2.3 Institution Awarding the Qualification (in original language)

Ludwig-Maximilians-Universität München
Technische Universität München

Status (Type / Control)
University / State Institution

2.4 Institution Administering Studies (in original language)

Ludwig-Maximilians-Universität München
Technische Universität München

Status (Type / Control)
University / State Institution

2.5 Language(s) of Instruction/Examination

German, English

Prof. Dr. Peter Gille

3. LEVEL OF THE QUALIFICATION

3.1 Level

Graduate, Master degree

3.2 Official Length of Programme

Two years, 120 ECTS credits

3.3 Access Requirements

Bachelor's degree (in a programme of at least 6 semesters duration) with a final grade of at least 2.5 (good) in one of the following fields: Geosciences, Geology, Geophysics, Mineralogy, Chemistry, Physics or a related subject; proven knowledge on English (minimum score on standardized tests as specified in the exam regulations (Prüfungsordnung))

4. CONTENTS AND RESULTS GAINED

4.1 Mode of Study

Full-time

4.2 Programme Requirements/Qualification Profile of the Graduate

The programme includes lectures, exercises, seminars and laboratories or field courses. A Master thesis is required that is equivalent to 30 ECTS

4.3 Programme Details

See „Masterzeugnis" (Degree Certificate), as well as the „Transcript of Records" for list of courses and grades, and topic of thesis, including evaluations.

4.4 Grading Scheme

General grading scheme cf. Sec. 8.6

4.5 Overall Classification (in original language)

gut, good -
based on the accumulation of grades received during the study programme and the final thesis; cf. Masterzeugnis (Degree Certificate)

Prof. Dr. Peter Gille

5. FUNCTION OF THE QUALIFICATION

5.1 Access to Further Study

Qualifies to apply for admission for doctoral work (thesis research). Can be used as part of the qualifications to apply to a doctoral program

5.2 Professional Status

The master's programme in Geomaterials and Geochemistry prepares for careers in academics as well as in industry.

6. ADDITIONAL INFORMATION

6.1 Additional Information

n.a

6.2 Further Information Sources

On the institution: www.lmu.de and www.mytum.de; on the programme www.geo.tum.de and www.geo.uni-muenchen.de - For national information sources cf. Sect. 8.8

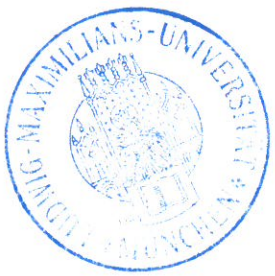
7. CERTIFICATION

This Diploma Supplement refers to the following original documents:
Masterzeugnis / Degree Certificate 29. September 2016

Certification Date: September 29, 2016

Prof. Dr. Peter Gille
Examination Committee

(Official Stamp/Seal)



8. 8. INFORMATION ON THE GERMAN HIGHER EDUCATION SYSTEM[1]

8.1 Types of Institutions and Institutional Status

Higher education (HE) studies in Germany are offered at three types of Higher Education Institutions (HEI).[2]

- 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 (Universities of Applied Sciences) 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 a distinct application-oriented focus and professional character of studies, which include 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).

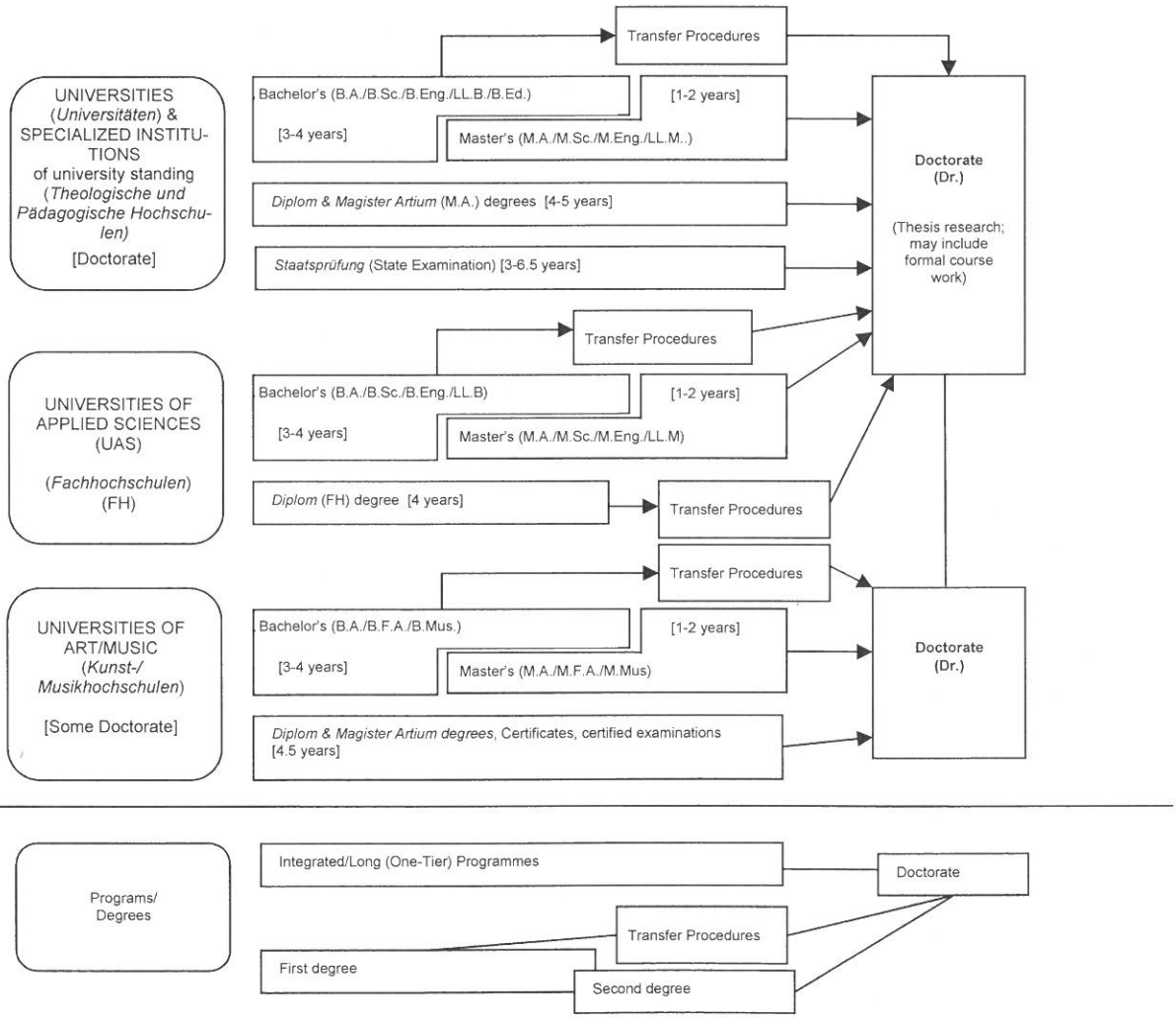
Within the framework of the Bologna-Process one-tier study programmes are successively being replaced by a two-tier study system. Since 1998, a scheme of first- and second-level degree programmes (Bachelor and Master) was introduced to be offered parallel to or instead of integrated „long" programmes. These programmes are designed to provide enlarged variety and flexibility to students in planning and pursuing educational objectives, they also enhance international compatibility of studies.

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 organization 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).3 In 1999, a system of accreditation for programmes of study has become operational under the control of an Accreditation Council at national level. All new programmes have to be accredited under this scheme; after a successful accreditation they receive the quality-label of the Accreditation Council.[4]

Table 1: Institutions, Programs and Degrees in German Higher Education



8.4 Organization and Structure of Studies

The following programmes apply to all three types of institutions. Bachelor's and Master's study courses 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 organization 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 degree study programmes lay the academic foundations, provide methodological skills and lead to qualifications related to the professional field. The Bachelor degree is awarded after 3 to 4 years. The Bachelor degree programme includes a thesis requirement. Study courses leading to the Bachelor degree must be accredited according to the Law establishing a Foundation for the Accreditation of Study Programmes in Germany.[5]
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).

8.4.2 Master

Master is the second degree after another 1 to 2 years. Master study programmes must be differentiated by the profile types „more practice-oriented" and „more research-oriented". Higher Education Institutions define the profile.
The Master degree study programme includes a thesis requirement. Study programmes leading to the Master degree must be accredited according to the Law establishing a Foundation for the Accreditation of Study Programmes in Germany.[6]
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 study programmes, which are designed for continuing education, may carry other designations (e.g. MBA).

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 specializations. 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 level

- Integrated studies at Universitäten (U) last 4 to 5 years (Diplom degree, Magister Artium) or 3 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, pharmaceutical and teaching professions are completed by a Staatsprüfung.
The three qualifications (Diplom, Magister Artium and Staatsprüfung) are academically equivalent. 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) /Universities of Applied Sciences (UAS) last 4 years and lead to a Diplom (FH) degree. While the FH /UAS are non-doctorate granting institutions, qualified graduates 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 organization, depending on the field and individual objectives. In addition to Diplom/Magister degrees, the integrated study programme awards include Certificates and certified examinations for specialized areas and professional purposes.

8.5 Doctorate

Universities as well as specialized institutions of university standing and some Universities of Art/Music are doctorate-granting institutions. Formal prerequisite for admission to doctoral work is a qualified Master (UAS and U), a Magister degree, a Diplom, a Staatsprüfung, or a foreign equivalent. Particularly qualified holders of a Bachelor 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.

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 institutions may already use the ECTS grading scheme, which operates with the levels A (best 10 %), B (next 25 %), C (next 30 %), D (next 25 %), and E (next 10 %).

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. Specialized variants (Fachgebundende Hochschulreife) allow for admission to particular disciplines. Access to Fachhochschule n (UAS) is also possible with a Fachhochschulreife, which can usually be acquired after 12 years of schooling. Admission to Universities of Art/Music may be based on other or require additional evidence demonstrating individual aptitude.
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]; Lennéstrasse 6, D-53113 Bonn; Fax: +49[0]228/501- 229; Phone: +49[0]228/501-0

- Central Office for Foreign Education (ZaB) as German NARIC; www.kmk.org; E-Mail: zab@kmk.org

- „Documentation and Educational Information Service" as German EURYDICE-Unit, providing the national dossier on the education system (www.kmk.org/doku/bildungswesen.htm; E-Mail: eurydice@kmk.org)

- Hochschulrektorenkonferenz (HRK) [German Rectors' Conference]; Ahrstrasse 39, D-53175 Bonn; Fax: +49[0]228/887 – 110; Phone: +49[0]228/887 – 0; 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)

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[1] The information covers only aspects directly relevant to purposes of the Diploma Supplement. All information as of 1 July 2010.

[2] 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 recognized as an academic degree if they are accredited by a German accreditation agency.

[3] Common structural guidelines of the Länder as set out in Article 9 Clause 2 of the Framework Act for Higher Education (HRG) for the accreditation of Bachelor's and Master's study courses (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany of 10.10. 2003, as amended on 04.02.2010.

[4] „Law establishing a Foundation 'Foundation for the Accreditation of Study Programmes in Germany", entered into force as from 26.2.2005, GV. NRW. 2005, nr. 5, p. 45 in connection with the Declaration of the Länder to the Foundation „Foundation: Foundation for the Accreditation of Study Programmes in Germany" (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany of 16.12.2004.

[5] See note No. 4.

[6] See note No. 4.