



Technische Universität München

With this diploma the
Technische Universität München
awards

Mr.
BENEDIKT SCHMIDT
born 26 September 1990 in Hall in Tirol
the academic title
MASTER OF SCIENCE

(M.Sc.)

which is equivalent to the academic title of

DIPLOM-INGENIEUR (TUM)

Dipl.-Ing. (TUM)

for demonstrating completion of the associated academic requirements
and successfully completing the master's examination at the Technische
Universität München.

This academic title may also include the name of the awarding university:

"MASTER OF SCIENCE (TUM)" or "M.Sc. (TUM)"

The result of the master's examination has been compiled
in the certificate.



München, 31 March 2015

(signed by)

Prof. Dr. Dr. h.c. mult. Wolfgang A. Herrmann
President



Technische Universität München

Die
Technische Universität München
verleiht mit dieser Urkunde

Herrn
BENEDIKT SCHMIDT

geboren am 26. September 1990 in Hall in Tirol
den akademischen Grad

MASTER OF SCIENCE
(M.Sc.)
äquivalent dem akademischen Grad
DIPLOM-INGENIEUR (TUM)
Dipl.-Ing. (TUM)

nachdem er die vorgeschriebenen wissenschaftlichen Studienleistungen
nachgewiesen und die Masterprüfung an der Technischen Universität
München erfolgreich abgelegt hat.

Dieser akademische Grad kann auch mit der
Herkunftsbezeichnung geführt werden:

"MASTER OF SCIENCE (TUM)" bzw. "M.Sc. (TUM)"

Das Ergebnis der Masterprüfung ist im Zeugnis dokumentiert.

München, 31. März 2015

Wolfgang A. Herrmann

Prof. Dr. Dr. h.c. mult. Wolfgang A. Herrmann
Präsident



Technische Universität München

CERTIFICATE



of Master's Examination for
Electrical Engineering and Information Technology

Mr.

BENEDIKT SCHMIDT

born 26 September 1990 in Hall in Tirol

successfully completed the master's examination with an
overall grade of 1,1 and the designation

PASSED WITH HIGH DISTINCTION



The topic of the master's thesis is:

**Implementation and Evaluation of the Holomorphic Embedding Load
Flow Method**

The thesis received the grade of 1,0.

Information about the degree program and the results of the
master's examination is available in the enclosed
Diploma Supplement and Transcript of Records.

München, 31 March 2015

Chair, Examination Board

(signed by)

Prof. Dr.-Ing. Erwin Biebl



Technische Universität München

ZEUGNIS



über die Masterprüfung im Studiengang
Elektrotechnik und Informationstechnik

Herr

BENEDIKT SCHMIDT

geboren am 26. September 1990 in Hall in Tirol

hat die Masterprüfung mit der Gesamtnote 1,1 und dem Prädikat

MIT AUSZEICHNUNG BESTANDEN

erfolgreich abgeschlossen.

Das Thema der Master's Thesis lautet:

**Implementation and Evaluation of the Holomorphic Embedding Load
Flow Method**

Diese Arbeit wurde mit der Note 1,0 bewertet.

Informationen zum Studiengang sowie Einzelergebnisse der
Masterprüfung sind dem beigefügten Diploma Supplement
und dem Transcript of Records zu entnehmen.

München, 31. März 2015

Der Vorsitzende des Prüfungsausschusses

Prof. Dr.-Ing. Erwin Biebl

Transcript of Records

Familienname/Family Name:
Schmidt

Geburtsdatum/Date of Birth:
26. September 1990
26 September 1990

Geburtsort/Place of Birth:
Hall in Tirol

Studiengang/Degree Program:
Elektrotechnik und Informationstechnik
Electrical Engineering and Information
Technology

Akademischer Grad/Academic Title:
Master of Science (M.Sc.)

Vorname(n)/First Name(s):
Benedikt

Geschlecht/Sex:
männlich
male

Matrikelnummer/Student ID Number:
03624050

Zeugnisdatum/Certificate Date:
31. März 2015
31 March 2015

Gesamtnote und -credits: Overall Grade and Credits:	1,1	120
Prädikat: Designation:	mit Auszeichnung bestanden passed with high distinction	

Masterarbeit Master's Thesis				30
EI8950	Masterarbeit Master's Thesis	1,0	30	
Thema: Implementation and Evaluation of the Holomorphic Embedding Load Flow Method Die Thesis wurde in englischer Sprache verfasst. Topic: Implementation and Evaluation of the Holomorphic Embedding Load Flow Method The thesis was written in English.				

Modul-ID Module ID	Modulbezeichnung Module Title	Note Grade	Credits Credits
Prüfungsleistungen Examination Performance			69
Wahlmodule Grundlagen Elective Module Fundamentals			18
EI7001	Multidimensional Digital Signal Processing Multidimensional Digital Signal Processing	1,7	6 *)
EI7007	Dynamische Systeme Dynamic Systems	1,0	6 *)
EI7005	Numerische Methoden der Elektrotechnik Numerical Methods in Electrical Engineering	1,3	6
Wahlmodule fachliche Vertiefung und fachliche Ergänzung Elective Module In-depth Specialization and In-depth Supplement			46
EI7404	Optimization Methods for Circuit Design Optimization Methods for Circuit Design	1,0	6 *)
EI7122	Leistungskurs C++ Advanced Programming in C++	1,0	6 *)
EI0432	Satellite Navigation Satellite Navigation	1,3	6 *)
EI7310	Batteriesystemtechnik Battery Systems Technical	1,0	5
EI7340	HW/SW Codesign HW/SW Codesign	2,4	6
EI7224	RoboSoccer Laboratory RoboSoccer Laboratory	1,0	6
EI7367	Praktikum Simulation digitaler Übertragungssysteme Laboratory Course on Simulation of Digital Transmission Systems	1,3	5 *)
EI7215	Projektpraktikum Vernetzte und kooperative Systeme Project Laboratory Networked and Cooperative Systems	1,0	6
Wahlmodule Hauptseminare Elective Module Advanced Seminar			5
EI7750	Hauptseminar VLSI-Entwurfsverfahren Advanced Seminar VLSI Design Methods	1,3	5
Studienleistungen (gehen nicht in die Endnote ein) Pass Credit Requirement (doesn't count for the final grade)			21
SZ0425	Englisch - Introduction to Academic Writing C1 English - Introduction to Academic Writing C1	2,0	3

Modul-ID Module ID	Modulbezeichnung Module Title	Note Grade	Credits Credits
SZ0408	Englisch - Basic English for Business and Technology - Global Module B2 English - Basic English for Business and Technology - Global Module B2	1,0	3 *)
SZ0442	Englisch - The Science of Science Fiction C1 English - The Science of Science Fiction C1	1,3	3
EI7899	Forschungspraxis (Master) 12 ECTS Research internship (Master) 12 ECTS	BE	12

Der Vorsitzende des Prüfungsausschusses
Chair, Examination Board

Prof. Dr.-Ing. Erwin Biebl

Prüfungsamt der Technischen Universität München
Examination Office of the Technical University München

A. Buchbauer
Andrea Buchbauer

Erläuterungen

1. Die Bewertung der Modulprüfungen wird durch folgende Noten ausgedrückt:

Note 1 "sehr gut"
 Note 2 "gut"
 Note 3 "befriedigend"
 Note 4 "ausreichend"
 Note 5 "nicht ausreichend"

Zur differenzierteren Bewertung können die Notenziffern um 0,3 erniedrigt oder erhöht werden.

Die Note 4,3 gilt als "nicht ausreichend".
 Die Noten 0,7 und 5,3 sind ausgeschlossen.

2. Die Modulnote lautet

von	1,0	bis	1,5	"sehr gut"
von	1,6	bis	2,5	"gut"
von	2,6	bis	3,5	"befriedigend"
von	3,6	bis	4,0	"ausreichend"
von	4,1	bis	5,0	"nicht ausreichend"

Wird ein Modul durch Modulteilprüfungen abgeschlossen, so errechnet sich die Modulnote aus dem gewichteten Durchschnitt der einzelnen Teilprüfungen. Die erste Stelle nach dem Komma wird berücksichtigt, alle weiteren werden ohne Rundung gestrichen.

3. Das Prädikat lautet bei einer Gesamtnote

von	1,0	bis	1,2	"mit Auszeichnung bestanden"
von	1,3	bis	1,5	"sehr gut bestanden"
von	1,6	bis	2,5	"gut bestanden"
von	2,6	bis	3,5	"befriedigend bestanden"
von	3,6	bis	4,0	"bestanden"

4. Bei der Berechnung der Gesamtnote wird nur die erste Nachkommastelle berücksichtigt. Genauere Informationen zur Gewichtung der Modulnoten und zur Berechnung der Gesamtnote sind in der Fachprüfungs- und Studienordnung (FPSO) für diesen Studiengang zu finden.

5. Folgende weitere Abkürzungen und Begriffe wurden in diesem Dokument verwendet:
 BE: bestanden
 Credits: gemäß dem European Credit Transfer System (ECTS) Maßeinheit für die Arbeitsbelastung eines Studierenden; ein Credit entspricht der Arbeitszeit von 30 Stunden

6. Das Zeugnisdatum entspricht dem Datum der letzten Leistung.

7. *) = anerkannt
 **) = enthält anerkannte Leistungen

Explanations

1. The grades for module examinations are assigned according to the following scale:

grade 1 "very good"
 grade 2 "good"
 grade 3 "satisfactory"
 grade 4 "sufficient"
 grade 5 "fail"

For the purpose of a more differentiated assessment, the above grades may be raised or lowered by 0,3.

A grade of 4,3 means "fail".
 The grades 0,7 and 5,3 are not possible.

2. The module grade is assigned according to the following scale:

1,0	to	1,5	"very good"
1,6	to	2,5	"good"
2,6	to	3,5	"satisfactory"
3,6	to	4,0	"sufficient"
4,1	to	5,0	"fail"

If completion of a module requires more than one examination component, the grade for the module represents the weighted average of the individual examination components. The first decimal place following the decimal separator will be taken into account without rounding. All subsequent decimal places are insignificant.

3. The designation is awarded according to the following scale:

1,0	to	1,2	"passed with high distinction"
1,3	to	1,5	"passed with distinction"
1,6	to	2,5	"passed with merit"
2,6	to	3,5	"passed"
3,6	to	4,0	"conceded pass"

4. The first decimal place following the decimal separator will be taken into account in calculating the overall grade. The Academic and Examination Regulations (FPSO) of the relevant degree program contain detailed information regarding the weighting of module grades and the calculation of the overall grade.

5. The following additional abbreviations and terms were used in this document:
 BE: pass
 Credits: a unit of measure within the European Credit Transfer System (ECTS) representing student workload. A credit is equal to 30 hours of work.

6. The certificate date is identical to the date of completion of the last exam.

7. *) = accredited
 **) = contains accredited exams

Diploma Supplement

Dieses Dokument gehört zu den Abschlussdokumenten und wird nur in englischer Sprache ausgestellt.
This supplement is part of the graduation documents and is issued only in the English language.

This model Diploma Supplement was developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient data to improve the international "transparency" and equitable recognition of academic and professional qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content and type of the studies pursued and successfully completed by the individual named on the original certificate. The original document must accompany this diploma supplement. It should be free from any value judgements, equivalence statements or recommendation as to recognition. Information should be provided in all eight sections. Where information is not supplied, an explanation for the omission is to be provided.

1. Holder of the Qualification

1.1 Family Name/1.2 First Name(s)

Schmidt, Benedikt

1.3 Date, Place of Birth

26 September 1990, Hall in Tirol

1.4 Student ID Number or Code

03624050

2. Qualification

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

Master of Science (M.Sc.)

Title Conferred (full, abbreviated; in original language)

This academic degree may also be used as follows:
'Master of Science (TUM)' or 'M.Sc. (TUM)'.

2.2 Main Field(s) of Study

Electrical Engineering and Information Technology

2.3 Institution Awarding the Qualification (in original language)

Technische Universität München

Status of Institution Awarding the Qualification (Type/Status (see section 8 below))

University / State Institution

2.4 Institution Administering Studies (in original language)

Technische Universität München

Status of Institution Administering Studies (Type/Status (see section 8 below))

University / State Institution

2.5 Language(s) of Instruction/Examination

German

3. Level of the Qualification

3.1 Level (e.g. bachelor, master, or doctorate)

Master's program (UNESCO ISCED Code 5A)

3.2 Standard Duration of Study

2 years (4 semesters)

3.3 Admission Requirements

Bachelor's degree or equivalent degree in electrical engineering, information technology or a related field, application and individual aptitude test.

4. Program Requirements and Learning Outcomes

4.1 Type of Program

Full-time study

4.2 Program Requirements/Qualification Profile of the Graduate

This master's program equips students for a professional career in industry or equally for postgraduate training with a view to doctoral studies. To this end, the education and training focus on advanced knowledge, building on the principles learned in the bachelor's program. This knowledge is supplemented during the course of the program with a portfolio of teaching modes and contents that enable students to acquire the skills necessary for work in research or industry and facilitate new forms of interdisciplinary cooperation. The program is characterized by a high degree of flexibility and gives students a wide range of options for gaining relevant occupational knowledge and expertise.

The skills objectives to be attained through the Electrical Engineering and Information Technology master's study program are classified as discipline-specific and generic or interdisciplinary skills. The discipline-specific skills are relevant to the particular area of engineering, while the generic ones include both skills from other fields, such as market orientation, and skills in the areas of personal development and social competency.

During the course of their time at TUM, graduates of the Electrical Engineering and Information Technology master's study program acquire the following skills profile:

- to understand the physical principles (that is, the electrical, mechanical, optical, quantum-mechanical and solid-state-theory effects) of different processes, be aware of the current state of research and further develop it with a large degree of autonomy using the skills acquired,

- to know the principles of mathematical modeling and the analytical methods and design of complex electrical or IT systems and to be able to implement them with a large degree of autonomy,

- to conduct academic work (see Master's Thesis and Research Practice) and then be able to take up doctoral studies (research skills), to classify the function of different technologies in complex electrical or IT systems in order to assess the technical, economic and ecological consequences and repercussions,

- to widely apply the above knowledge and skills or, depending on the options selected, additional technical and methodological skills in the specialized areas of Automation Technology, Electronics, Power Engineering, Information & Communications Technology and Mechatronics,

- to detect and drive innovation in the field of Electrical Engineering and Information Technology and to critically assess its potential.

In terms of generic or interdisciplinary skills, graduates of the Electrical Engineering and Information Technology master's program will be able

- to understand the conditions imposed on Electrical Engineering and Information Technology by a competitive market and apply economic evaluation methods (business expertise),

- to manage information efficiently and communicate it within a team across the boundaries of

different disciplines, genders and cultures (information literacy and communication skills),
-to play a lead role in a project team (leadership skills),
-to manage complex systems and use joined-up thinking,
-in view of future professional prospects in the international arena, to understand and appreciate the diverse background of different academic, work and life cultures (social competency),
-to take society's reservations and concerns seriously and not only discuss their own discoveries and solutions with experts, but also communicate them to the public, thereby taking an active role in social debate (sociopolitical expertise).

4.3 Program Details

See Transcript of Records enclosed.

ECTS credits: 120

4.4 Grading Scale

See Transcript of Records enclosed.

4.5 Overall Grade and Designation (in original language)

1,1 mit Auszeichnung bestanden

5. Formal Qualifications

5.1 Access to Further Study

Doctoral program, Postgraduate studies

5.2 Professional Status

Diploma according to the guideline 89/48/EWG

6. Additional Information

6.1 Additional Information

6.2 Further Information Sources

Electrical Engineering and Information Technology

www.ei.tum.de

<http://www.ei.tum.de/studienbetrieb/master/masterstudiengang-ei/>

TU München: Since its foundation in 1868, the Technische Universität München (TUM) has established a sound reputation as a leading institution of higher education. To date, the university boasts some 13 Nobel laureates among its professorial staff and alumni. The spectrum of disciplines offered at the TUM includes the natural sciences, engineering sciences, medicine, life sciences, economics and professional education. Today, TUM comprises 13 colleges and schools, 3 integrative research centers and 6 corporate research centers, which serve as the academic home of its approximately 38,000 students (some 20% international) and 500 professors, together with roughly 10,000 academic and non-academic staff. As one of Germany's top-ranking universities, TUM was a recipient of excellence awards in both 2006 and 2012 for its institutional strategies within the parameters of the "Excellence Initiative" of the German Federal Government.

www.tum.de

7. Certification

This Diploma Supplement refers to the following original documents:

Urkunde/Diploma
Zeugnis/Certificate
Transcript of Records



Certificate Date: 31 March 2015

Prof. Dr.-Ing. Erwin Biebl
Chair, Examination Board

8. National Higher Education System

The information on the national higher education system provided on the following pages explains the level of qualification and status of the awarding institution.

8. Information on the German Higher Education System¹

8.1 Types of Institutions and Institutional Status

Higher education in Germany is offered at three different types of institutions.²

- *Universitäten* (Universities) including various specialized institutions, offer the entire range of academic disciplines. German universities traditionally focus on basic research so that advanced stages of study are, above all, both theoretical and research-oriented.

- *Fachhochschulen* (Universities of Applied Sciences) offer degree programs focused mainly on engineering and other technical disciplines, business-related studies, applied social sciences, and design. The common mission of applied research and development implies the distinct application-oriented focus and professional character of their studies, which include integrated and supervised internships in industry, at companies or other relevant institutions.

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

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

8.2 Types of Programs and Degrees Awarded

Studies at all three types of institutions have traditionally been offered in the form of integrated continuous (one-tier) programs completed by a *Staatsprüfung* (State Examination) or awarding of the *Diplom* or *Magister Artium* degree.

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

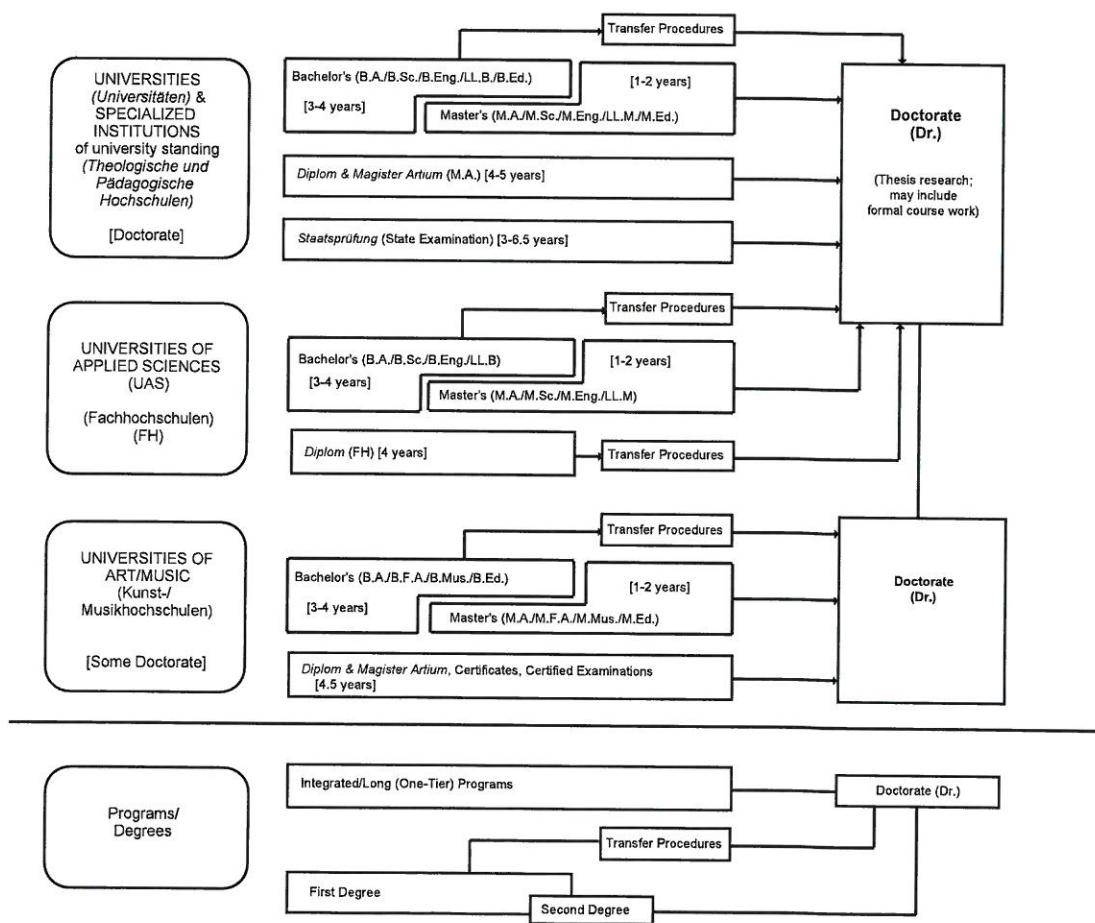
The German Qualification Framework for Higher Education Degrees³ describes the degrees awarded with the German Higher Education System. It contains the classification of the qualification levels as well as the resulting qualifications and competencies of the graduates.

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

8.3 Approval/Accreditation of Programs and Degrees

To ensure the quality and comparability of qualifications, the organization of studies and general degree requirements must conform to the standards 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).⁴ In 1999, a system of accreditation for programs of study was introduced at the national level and placed under the control of an Accreditation Council at national level. All new programs must be accredited in compliance with this system; after successful accreditation, programs receive the quality-label of the Accreditation Council.⁵

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



8.4 Organization and Structure of Studies

The following programs apply to all three types of institutions. Bachelor's and master's programs may be completed 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 programs 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's

Bachelor's degree programs lay the academic foundations, provide methodological skills and lead to qualifications related to the professional field. The bachelor's degree is awarded after 3 to 4 years. The bachelor's degree program includes a thesis requirement. Programs leading to the bachelor's degree must be accredited according to the "Law for the Establishment of the Foundation: 'Foundation for the Accreditation of Degree Programs in Germany'" (*Gesetz zur Errichtung einer Stiftung: "Stiftung zur Akkreditierung von Studiengängen in Deutschland"*)⁶. First degree programs (bachelor's) 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's

The master's is the second degree following an additional 1 to 2 years of study. Master's programs can be differentiated by two profile types, those with greater emphasis on practice and those with greater emphasis on research. Institutions of higher education define the profile of each master's program. Master's programs include a thesis requirement. Programs leading to the master's degree must be accredited according to the "Law for the Establishment of the Foundation: 'Foundation for the Accreditation of Degree Programs in Germany'" (*Gesetz zur Errichtung einer Stiftung: "Stiftung zur Akkreditierung von Studiengängen in Deutschland"*)⁷. Second degree programs (master's) lead to Master of Arts (M.A.), Master of Science (M.Sc.), Master of Engineering (M.Eng.), Master of Laws (LL.M.), Master of Fine Arts (M.F.A.), Master of Music (M.Mus.) or Master of Education (M.Ed.). Master's programs designed for continuing education may carry other designations (e.g. MBA).

8.4.3 Integrated "Long" Programs (One-Tier): *Diplom, Magister Artium, Staatsprüfung*

An integrated course of study is either mono-disciplinary (*Diplom* degrees, most programs 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) is designed to provide students with broad and fundamental knowledge of their 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's.

- The standard duration of study for integrated programs at *Universitäten* (U) is 4 to 5 years (*Diplom, Magister Artium*) or 3 to 6.5 years (*Staatsprüfung*). The *Diplom* is awarded in engineering disciplines, the natural sciences as well as economics and business. In the humanities, the corresponding degree is generally the *Magister Artium* (M.A.). In the social sciences, practice varies as a matter of institutional tradition. 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 the holder to apply for admission to doctoral studies. Further prerequisites for admission may be defined by individual institutions of higher education, cf. Sec. 8.5.

- The standard duration of study for integrated programs at *Fachhochschulen* (FH)/Universities of Applied Sciences (UAS) is 4 years. These programs lead to a *Diplom* (FH). While the FH/UAS are not entitled to offer doctoral programs, qualified graduates may apply for admission to doctoral studies at institutions entitled to do so, cf. Sec. 8.5.

- The organization and structure of studies at *Kunst- und Musikhochschulen* (Universities of Art/Music etc.) varies according to the student's field and individual objectives. In addition to *Diplom/Magister* degrees, the integrated programs at these institutions may award certificates and certified examinations for specialized areas and professional purposes.

8.5 Doctorate

Universities and specialized institutions of university standing, as well as some Universities of Art/Music, are entitled to offer doctoral studies. Formal prerequisite for admission to doctoral studies is a qualified Master's (UAS and U), a *Magister*, a *Diplom*, a *Staatsprüfung*, or a foreign equivalent.

Particularly qualified holders of a Bachelor's or a *Diplom* (FH) may also be admitted to doctoral studies without having acquired a Master's or equivalent, provided that they pass an aptitude test. The universities and other institutions entitled to offer doctoral programs determine admission and aptitude testing requirements. Admission to doctoral programs is also subject to the prior approval of the thesis topic by a supervising professor.

8.6 Grading Scale

The grading scale in Germany generally 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) = Insufficient/Fail. The minimum passing grade is "Ausreichend" (4). In some cases, as well as for the designation of doctoral degrees, verbal descriptions of the numerical grades may vary. Some institutions additionally employ the ECTS grading scale.

8.7 Access to Higher Education

The General Higher Education Entrance Qualification (*Allgemeine Hochschulreife, Abitur*) awarded after 12 to 13 years of schooling, qualifies students to apply for university studies in all disciplines. Subject-specific entrance qualifications (*Fachgebundene Hochschulreife*) qualify students only for particular disciplines. Access to *Fachhochschulen* (UAS) is also possible with a *Fachhochschulreife*, which is generally awarded after 12 years of schooling. Admission to universities of Art/Music may be contingent upon other prerequisites or require additional evidence of special aptitude. Additional admissions requirements may apply in certain cases for some institutions of higher education.

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, 53117 Bonn; Phone: +49.228.501.0; Fax: +49.228.501.777
- Central Office for Foreign Education (ZaB) as German NARIC; www.kmk.org; Email: zab@kmk.org
- "Documentation and Educational Information Service" as German EURYDICE-Unit, providing the national dossier on the education system (www.kmk.org/dokumentation/deutsche-eurydice-stelle-der-laender.html); Email: eurydice@kmk.org)
- *Hochschulrektorenkonferenz (HRK)* [German Rectors' Conference]; Ahrstr. 39, D-53175 Bonn; Phone: +49.228.887.0; Fax: +49.228.887.110; www.hrk.de; Email: post@hrk.de
- "Higher Education Compass" of the German Rectors' Conference features comprehensive information on institutions, degree programs, etc. (www.higher-education-compass.de)

¹ The information provided here covers only aspects related to the Diploma Supplement. All information was last updated on 1 July 2010.

² *Berufskademien* exist only in some of the *Länder* and are not considered to be institutions of higher education. These institutions offer educational programs in close cooperation with private companies. Students receive formal certification and complete an apprenticeship at the company. Some *Berufskademien* offer bachelor's programs which are recognized as academic degrees, if they are accredited by a German accreditation agency.

³ German Qualification 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 21 April 2005).

⁴ Common structural guidelines of the *Länder* for the accreditation of bachelor's and master's programs (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 10 October 2003, as amended on 4 February 2010).

⁵ "Law for the Establishment of the Foundation 'Foundation for the Accreditation of Degree Programs in Germany'", entered into force as from 26 February 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 Programs 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 December 2004).

⁶ See note No. 5.

⁷ See note No. 5.

Grading-Tabelle

Grading Table

Familienname/Family Name:
Schmidt

Geburtsdatum/Date of Birth:
26. September 1990
26 September 1990

Geburtsort/Place of Birth:
Hall in Tirol

Studiengang/Degree Program:
Elektrotechnik und Informationstechnik
Electrical Engineering and Information Technology

Akademischer Grad/Academic Title:
Master of Science (M.Sc.)

Erfassungszeitraum/Data Collection Period:
31. März 2013 bis 31. März 2015
31 March 2013 to 31 March 2015

Vorname(n)/First Name(s):
Benedikt

Geschlecht/Sex:
männlich
male

Matrikelnummer/Student ID Number:
03624050

Prädikat/Designation:
mit Auszeichnung bestanden
passed with high distinction

Gesamtnote/Overall Grade:
1,1

Zeugnisdatum/Certificate Date:
31. März 2015
31 March 2015

Abschlüsse pro Prädikat/Degrees per Designation:

Gesamtnote Overall Grade	Prädikat Designation	Anzahl Number	(I) (I)	(II) (II)
1,0 ≤ x ≤ 1,2	mit Auszeichnung bestanden passed with high distinction	68	15,1%	15,1%
1,2 < x ≤ 1,5	sehr gut bestanden passed with distinction	145	32,3%	47,4%
1,5 < x ≤ 2,5	gut bestanden passed with merit	231	51,5%	98,9%
2,5 < x ≤ 3,5	befriedigend bestanden passed	5	1,1%	100,0%
3,5 < x ≤ 4,0	bestanden conceded pass	0	0,0%	100,0%
Anzahl der Abschlüsse/Number of Degrees Awarded:		449		

Anzahl der erfolgreich abgelegten Abschlüsse pro Prädikat in Relation zu der Zahl der Absolventen, die dieses Prädikat erzielt haben (I) bzw. die dieses oder ein besseres Prädikat erzielt haben (II)

Number of awarded degrees per designation in relation to the percentage of total graduates in the reference period earning the same score (I) or earning the same or higher score respectively (II)

Abschlüsse pro Gesamtnote/Degrees per Overall Grade:

Gesamtnote Overall Grade	Anzahl Number	(I) (I)	(II) (II)	Gesamtnote Overall Grade	Anzahl Number	(I) (I)	(II) (II)
1,0	15	3,3%	3,3%	2,6	0	0,0%	98,9%
1,1	15	3,3%	6,7%	2,7	2	0,5%	99,3%
1,2	38	8,5%	15,1%	2,8	0	0,0%	99,3%
1,3	51	11,4%	26,5%	2,9	2	0,5%	99,8%
1,4	55	12,3%	38,8%	3,0	0	0,0%	99,8%
1,5	39	8,7%	47,4%	3,1	1	0,2%	100,0%
1,6	45	10,0%	57,5%	3,2	0	0,0%	100,0%
1,7	38	8,5%	65,9%	3,3	0	0,0%	100,0%
1,8	37	8,2%	74,2%	3,4	0	0,0%	100,0%
1,9	32	7,1%	81,3%	3,5	0	0,0%	100,0%
2,0	15	3,3%	84,6%	3,6	0	0,0%	100,0%
2,1	19	4,2%	88,9%	3,7	0	0,0%	100,0%
2,2	13	2,9%	91,8%	3,8	0	0,0%	100,0%
2,3	19	4,2%	96,0%	3,9	0	0,0%	100,0%
2,4	4	0,9%	96,9%	4,0	0	0,0%	100,0%
2,5	9	2,0%	98,9%				

Anzahl der Abschlüsse/Number of Degrees Awarded:**449**

Anzahl der erfolgreich abgelegten Abschlüsse pro Gesamtnote in Relation zu der Zahl der Absolventen, die dieselbe Gesamtnote erzielt haben (I) bzw. die dieselbe oder eine bessere Gesamtnote erzielt haben (II)

Number of awarded degrees per overall grade in relation to the percentage of total graduates in the reference period earning the same score (I) or earning the same or higher score respectively (II)

Erläuterungen

Für jede Gesamtnote wird im Rahmen des Bologna-Prozesses zusätzlich zur individuellen Benotung die Angabe der Notenverteilung sowie der Rangfolge in einer charakteristischen Vergleichsgruppe gefordert. Dies erleichtert die Vergleichbarkeit von Gesamtnoten, die an verschiedenen Universitäten erbracht wurden. Die Technische Universität München verpflichtet sich mit dem im Folgenden dargestellten Vorgehen zu größtmöglicher Transparenz.

Dem erzielten Prädikat bzw. der Gesamtnote wird die Häufigkeit ihres Auftretens in der jeweiligen Vergleichsgruppe gegenübergestellt. Die in den obenstehenden Tabellen ausgewiesenen Prozentzahlen geben an, wie viele Abschlüsse in der Vergleichsgruppe ebenso gut (I) bzw. ebenso gut wie oder besser als die zugeordnete(n) Note(n) (II) ausgefallen sind.

Die Vergleichsgruppe ergibt sich aus der Summe aller zum Ausstellungsdatum dieser Grading Tabelle vorliegenden und im Referenzzeitraum bestandenen Abschlüsse.

Explanations

In compliance with the requirements of the Bologna Process, information on grade distribution and the student's ranking within a characteristic comparison group is reported in addition to the student's individual overall grade. This information facilitates the comparison of overall grades achieved at different universities. The Technische Universität München aims to provide maximum transparency by means of the procedure described below.

The individual student's overall grade and designation are considered in relation to the frequency of their occurrence in the respective comparison group. The percentages shown in the above grading tables indicate how many scores in the comparison group were as good as (I) and as good as or better than (II) the score indicated in the first column.

The comparison group is the total of all degrees awarded within the reference period and included in this grading table up to and including its date of issue.

Ausstellungsdatum/Issue Date: 08.09.2015