# 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**
Schröder

**1.2 First Name**
Rolf Paul

**1.3 Date, Place of Birth**
May 4, 1988, Ludwigsfelde

**1.4 Student ID Number or Code**
342126

## 2. QUALIFICATION

**2.1 Name of Qualification and Title Conferred** (full, abbreviated; in original language)
Master of Science, M.Sc.

**2.2 Main Field(s) of Study**
Computer Science

**2.3 Institution Awarding the Qualification**
Technische Universität Berlin
School IV – Electrical Engineering and Computer Sciences
**Status (Type / Control)**
University / State Institution

**2.4 Institution Administering the Studies**
See above
**Status (Type / Control)**
See above

**2.5 Language(s) of Instruction/Examination**
German and English

## 3. LEVEL OF THE QUALIFICATION

**3.1 Level**
Master's degree (Second cycle degree) with master- thesis

**3.2 Official Length of Programme**
2 years = 4 semesters = 120 credit points (according to ECTS)

**3.3 Access Requirements**
- a Bachelor in Computer Science or equivalent degree
- TOEFL test 80 points internet based or equivalent certification
- For foereign students German language test DSH or equivalent certification

## 4. CONTENTS AND RESULTS GAINED

**4.1 Mode of Study**
Full-time

**4.2 Programme Requirements/Qualification Profile of the Graduate**
Graduates of the master's programme in Computer Science are employed in the area of problem solving, which requires creativity, the ability to work independently and think abstractly. Most of the work in a team requires additional cooperation and communication skills. It is also especially helpful for computer scientists to be able to present their work results confidently in a structured form. The job market, which is increasingly characterised by mobility and internationalisation, also requires a sufficient mastery of English. In the future emphasis will be placed on the ability to offer complete problem solving in the area of information technology. For this reason this course of study has a comprehensive range of teaching from all sectors of computer science. It is geared toward the acquisition of scientific procedures and methods. Graduates are trained in the master's programme to handle scientific problems independently. This means they are able to carefully select the proper scientific method and technical resources mastered at that point, apply them systematically and develop them further.

### 4.3 Programme Details
Subjects studied, exams and marks - see certificate

### 4.4 Grading Scheme

| individual grades | | overall grade | |
|---|---|---|---|
| 1,0; 1,3 | sehr gut / very good | 1,0 - 1,5 | sehr gut / very good |
| 1,7; 2,0; 2,3 | gut / good | 1,6 - 2,5 | gut / good |
| 2,7; 3,0; 3,3 | befriedigend / satisfactory | 2,6 - 3,5 | befriedigend / satisfactory |
| 3,7; 4,0 | ausreichend / fair | 3,6 - 4,0 | ausreichend / fair |

### 4.5 Overall Classification (in original language)
1,3 / sehr gut

## 5. FUNCTION OF THE QUALIFICATION

### 5.1 Access to Further Study
The MSc Computer Science provides access to doctoral studies.

### 5.2 Professional Status
By considering various requirements from a methodological, interdisciplinary and comprehensive perspective, students in the Computer Science course are trained to assume positions, depending on their inclination, in many diverse areas. Employment opportunities for computer scientists with a master's degree reflect the diversity in information technology. Most computer scientists are concerned with the development of hardware and software systems in industry, finance and administration. The number of employers in pure IT companies has diminished to the benefit of IT end-user companies. IT end-user companies include producers of technical products (automobile manufacturers, mechanical engineers), as well as banks, insurance companies, commercial enterprises or administrative departments. Computer scientists with a university education possess analytical and communication skills that are indispensable for business consulting. With these competencies they are also qualified for managerial positions. This education enables graduates to work in research and scientific fields, in public institutions as well as research departments in industry. Many computer scientists also work in the area of education, such as at universities, technical colleges, vocational schools or institutions of further education.

## 6. ADDITIONAL INFORMATION

### 6.1 Additional Information
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### 6.2 Further Information Sources
About the institution: http://www.tu-berlin.de
About the programme: http://www.tu-berlin.de/?2006
National information sources see section 8

## 7. CERTIFICATION
This Diploma Supplement refers to the following original documents:
Urkunde über die Verleihung des Grades (Master of Science) vom November 7, 2013
Prüfungszeugnis (Masterprüfung) vom November 7, 2013

Certification Date:

(Official Stamp/Seal)

Chairperson of Examination Committee

## 8. National Higher Education Systems
The information on the national higher education system on the follow pages provides a context for the qualification and the type of higher education that awarded it (DSDOC 1/03.00).

# 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).

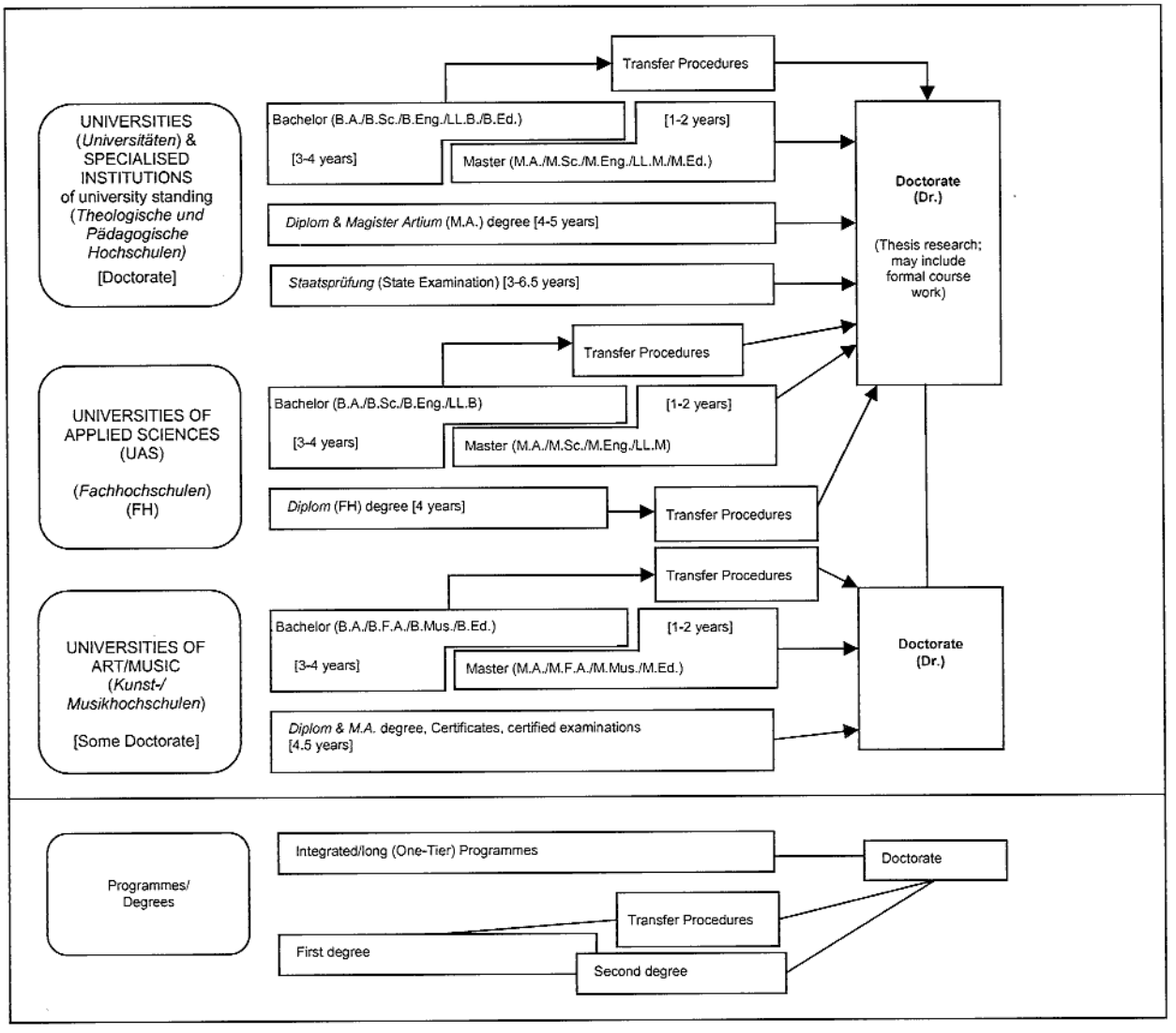
Within the framework of the Bologna-Process one-tier study programmes are successively being replaced by a two-tier study system. Since 1998, a scheme of first- and second-level degree programmes (Bachelor and Master) was introduced to be offered parallel to or instead of integrated "long" programmes. 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 became 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, Programmes 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 may be differentiated by the profile types "practice-oriented" and "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 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. 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 partly already use an ECTS grading scheme.

### 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 *Fachhochschulen* (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 (http://www.kmk.org/dokumentation/zusammenarbeit-auf-europaeischer-ebene-im-eurydice-informationsnetz.html; 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 21.4.2005).

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.