

Hans Mustermann

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 / 1.2 First Name

Mustermann, Hans

1.3 Date, Place of Birth

1990-01-01, Wernigerode

1.4 Student ID Number - Enrolment Code

21800

2. QUALIFICATION

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

Bachelor of Engineering (B. Eng.)

Title Conferred (full, abbreviated; in original language)

Does not apply

2.2 Main Field(s) of Study

Engineering and Management (career accompanying) with the specializations:

- Renewable Energy Systems
- Logistic Management
- Energy and Utility Industries

2.3 Institution Awarding the Qualification (in original language)

Hochschule Harz - Hochschule für angewandte Wissenschaften (FH)

Status (Type and Control)

University of Applied Sciences / State University

2.4 Institution Administering Studies (in original language)

Hochschule Harz - Hochschule für angewandte Wissenschaften (FH)

Status (Type and Control)

University of Applied Sciences / State University

2.5 Language(s) of Instruction and Examination

German and English

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3. LEVEL OF THE QUALIFICATION

3.1 Level

graduate/ first professional qualifying degree with degree thesis (Bachelor EQF Level 6)

3.2 Official Length of Programme

4.5 years with 9 semesters

3.3 Access Requirements

Before beginning the studies, one of the following conditions for admission must be fulfilled:

- General Higher Education Entrance Qualification
- Specialised Higher Education Entrance Qualification
- General Higher Education Entrance Qualification for Universities of Applied Science
- University Administered Entrance Exam
- A qualification for entrance to higher education deemed equivalent by the Land Saxony-Anhalt
- relevant vocational training

4. CONTENTS AND RESULTS GAINED

4.1 Mode of Study

Part-time, learning and self-learning programme

4.2 Programme Requirements and Qualification Profile of the Graduate

The Bachelor's programme 'Engineering and Management' qualifies graduates to support management in interdisciplinary tasks of business and technology issues. These include e. g. product and production planning, logistics, marketing and sales and the implementation of management systems. Graduates have the following qualifications:

Graduates acquired the following knowledge:

- broad overview and solid background in the science basics (mathematics, physics), in the electrical and automation engineering related subjects as well as in the essential business areas (including knowledge of essential tasks of corporate functions as well as processes and their mutual interactions).
- broad overview and solid background in selected integrated courses which cover economic, technical and socio-ethical aspects and processes.

Graduates are able to:

- identify, analyse and structure technical and economic tasks and solve them in a team,
- develop and implement application-oriented solutions on the basis of process and data analyses, as well as critically question existing solutions and optimize them,
- thereby select and apply appropriate technical and managerial methods.

Graduates have the following skills:

- They understand the economic, political, social, ethical and legal framework of economy and society, and incorporate them into their decision making.
- They recognize complex tasks in a technical and economic context and solve them interdisciplinarily, holistically and methodically.
- They are able to express themselves logically in oral as well as written communication.
- They do this convincingly and reasonably on both general and professional issues.
- They can cooperate interdisciplinarily and positively with people and teams on domestic and international markets, including project management tasks.
- They utilize modern information technology effectively.
- They learn independently and will continue their education in the future.

Renewable Energy Systems:

Graduates decide on the efficient use of renewable energy sources in accordance to local conditions. They evaluate

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producer and consumer energy profiles, and cross-link existing decentralised energy sources. They have a broad overview on the process engineering of biomass, solar energy, wind and water power, and on solid fuel combustion.

Graduates are familiar with the components of energy conversion coming from renewable energy sources to be stored in appropriate storage facilities in order to counterbalance fluctuating energy supply and demand. They design electrochemical storage systems and size associated components appropriately taking into account technical and economic aspects. They know the general operation principles and applicability of electrical machines. They assess the efficiency of those and suggest appropriate measures to increase performance and efficiency.

Graduates have a broad understanding of solar thermal and photovoltaic materials and technologies. They calculate the diverse parameters of solar modules, solar power generators and storage devices in order to optimize their productivity. They use their methodical knowledge about solar heat transfer to design solar thermal facilities to be deployed in buildings and industrial sites.

Graduates calculate the heating energy level of buildings and set up cumulative energy balances. They draft documentations taking into account ecological, economic, social and ethical aspects.

Logistic Management:

Graduates know the business-oriented analysis, planning, management and control of a cross-functional logistic management and related operations. They know how to classify procurement items, to organise operational procurement processes, and to make needs' assessments, averaging, exponential smoothing. They plan order processes in terms of quality, quantity and time, comprehensively. They know how to run an effective warehouse and stock management.

Graduates cope with quantity planning, output performance and schedule planning, order release, order control and supply chain management, appropriately. They draft and implement concepts of production planning and control. They use the SAP/R3 software for enterprise resource planning purposes.

The graduates know various types of optimization problems and how to model them either as a linear optimization problem or as a graph theory problem. To solve these problems, they use the simplex algorithm or specific algorithms for finding shortest paths, spanning trees or maximal flows in graphs.

The graduates know fundamental patterns, requirements and features of production and process control systems. They record and visualize business processes, activities and cycles by means of those control systems, and the adjust them where requested. They are familiar with basic automation features, process visualisation and engineering drawing. They know how to handle usual CAD systems, design requirements' and process schemes related to product development and select the appropriate methodology.

Energy and Utility Industries:

Graduates have a broad overview and knowledge base on the energy supply and utility sector including electric power networks and trade, gas distribution networks and trade, heating grids' management, recycling economy, (public) water supply and wastewater treatment, among others. They know methods and techniques of risk management, sales and distribution, taxation, surcharge calculation, and pricing.

Graduates consider the process of energy transition as a societal challenge and responsibility which is subject to EU regulation and gradual market liberalisation. They know the most relevant EU directives and regulations, as well as German laws and regulations, in particular the German Electric Power and Gas Provision Act, German Renewable Energy Sources Act, and the German Act on Combined Heat and Power Generation.

This combination of technological comprehension with sector specific management and legislation knowhow enables the graduates to recognize the political and policy framework conditions, and to align business operations accordingly. On that grounds, graduates act cross-functionally taking into account commercial requirements and regulatory constraints.

Hans Mustermann**4.3 Programme Details**

Courses taken	Grade	Performance appraisal	ECTS credits	ECTS grade
Introduction to Business Administration	2,3	satisfactory	5	(*)
Corporation Management	2,4	good	5	(*)
Mathematics I	2,0	very good	5	(*)
Physics	2,1	good	5	(*)
Techniques and Methods of Scientific Work	2,2	satisfactory	5	(*)
Financial Accounting	1,1	very good	5	(*)
Marketing	2,8	good	5	(*)
Mathematics II	2,1	satisfactory	5	(*)
English	1,9	satisfactory	5	(*)
Fundamentals of Computer Science	2,6	good	5	(*)
Taxation	3,4	good	5	(*)
Statistics	2,0	satisfactory	5	(*)
Electrical Engineering	1,1	good	5	(*)
Programming	1,7	satisfactory	5	(*)
Personnel Management	3,5	very good	5	(*)
Measurement, Sensors and Actuators	2,4	very good	5	(*)
Digital Fundamentals and Industrial Control	2,5	good	5	(*)
Database Systems	1,9	good	5	(*)
Business Finance	2,4	very good	5	(*)

Hans Mustermann**4.3 Programme Details**

Courses taken	Grade	Performance appraisal	ECTS credits	ECTS grade
Automatic Control	2,7	good	5	(*)
Business and Sustainability	2,8	good	5	(*)
Enterprise Resource Planning System	1,2	good	5	(*)
Management Control	1,2	good	5	(*)
Project Management	1,1	good	5	(*)
Professional Field Orientation: Renewable Energies	2,0	good		(*)
Professional Field Orientation: Logistics	2,3	good		(*)
Professional Field Orientation: Energy and Utility Industries	1,2	very good		(*)
Project Work	1,8	good	15	(*)
Colloquium	1,0	good	3	(*)
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Bachelor Thesis	1,1	very good	12	(*)
Theme: Hier steht dann der Titel der Bachelor- bzw. Masterarbeit				
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		Total ECTS credits	210	

Hans Mustermann**4.4 Grading Scheme**

HS Harz grade	Performance	Performance appraisal	Performance appreciation
1,0 1,3	95 - 100 % 90 - 94 %	Very good	An excellent performance
1,7 2,0 2,3	85 - 89 % 80 - 84 % 76 - 79 %	Good	A performance significantly above average standard
2,7 3,0 3,3	72 - 75 % 68 - 71 % 63 - 67 %	Satisfactory	An average performance
3,7 4,0	58 - 62 % 50 - 57 %	Sufficient	A performance which meets minimum requirements despite of shortcomings
5,0	0 - 49 %	Fail	A performance which fails to meet the minimum requirements due to significant shortcomings

The calculation of the ECTS grade results from an examination cohort of the three preceding semesters. In order to be calculated, the ECTS grade requires at least 20 examination events in the examination cohort.

See below section 8.6

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4.5 Overall Classification (in original language)

gut (2,3) - ECTS-Note: (*)

5. FUNCTION OF THE QUALIFICATION

5.1 Access to Further Study

Graduates are able to deepen their knowledge and competencies in master programs. Based on the bachelor degree acquired in the curriculum described here, they can get access to MBA-curricula as well as other master programs in computer science and related fields.

5.2 Professional Status

Does not apply

6. ADDITIONAL INFORMATION

6.1 Additional Information

6.2 Further Information Sources

www.hs-harz.de
+49 3943 659 300

7. CERTIFICATION

This Diploma Supplement refers to the following original documents:

Urkunde über die Verleihung des Grades issued on 08.02.2018

Prüfungszeugnis issued on 08.02.2018

Transcript of Records issued on 08.02.2018

Certification Date: 2018-02-08

Chairman Examination Committee

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 that awarded it.

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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 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 and Master) have been introduced in almost all study programmes. This change is designed to provide enlarged variety and flexibility to students in planning and pursuing educational objectives, they also enhance international compatibility of studies.

The German Qualifications Framework for Higher Education Degrees [3], the German Qualifications Framework for Lifelong Learning [4] and the European Qualifications Framework for Lifelong Learning [5] describe the degrees of the German Higher Education System. They contain the classification of the qualification levels as well as the resulting qualifications and competencies of the graduates.

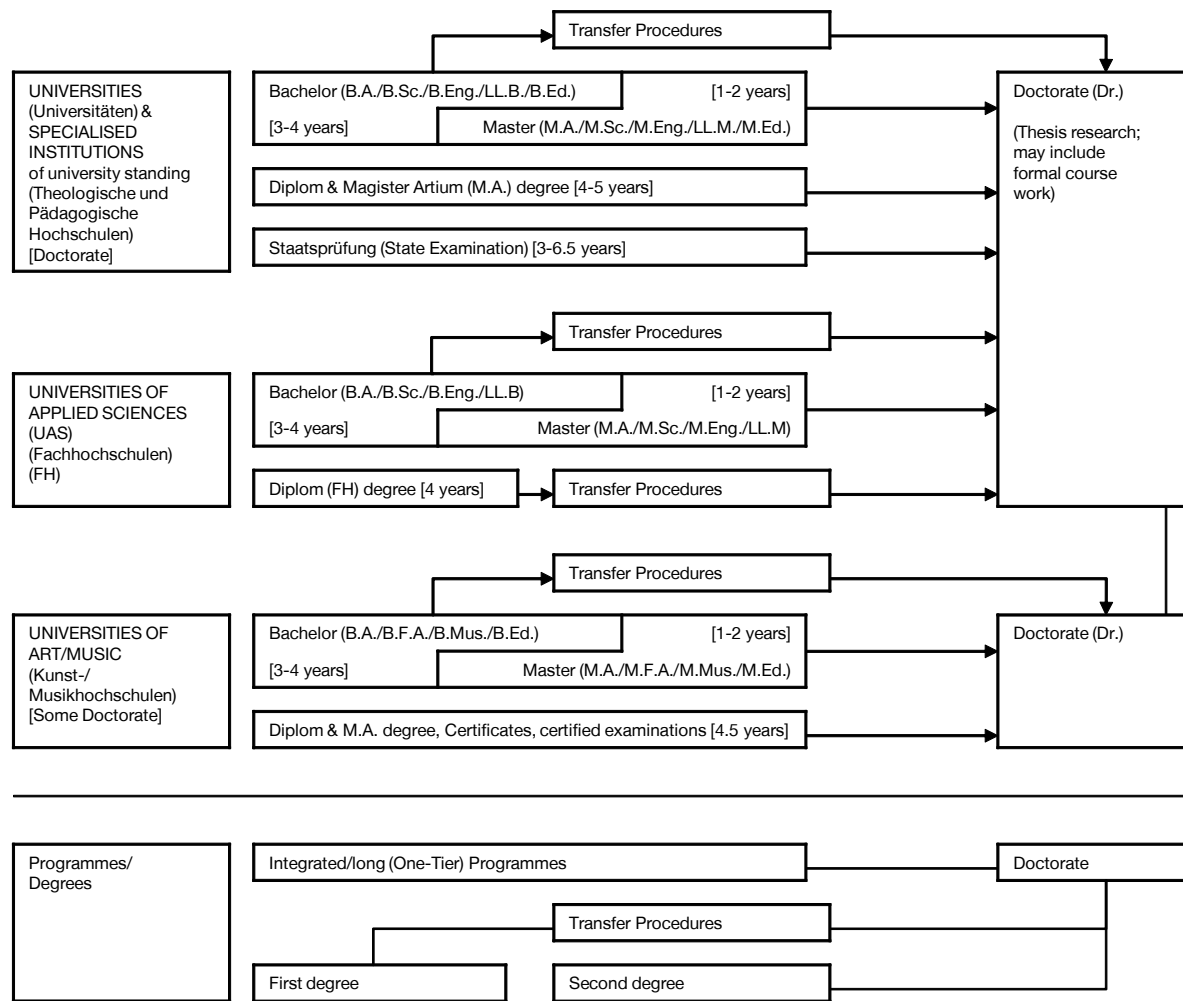
For details cf. Sec. 8.4.1, 8.4.2, and 8.4.3 respectively. Table 1 provides a synoptic summary.

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). [6] 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. [7]

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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.

Hans Mustermann**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. [8] 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 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 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. [9] 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).

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 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 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)/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.

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.

Hans Mustermann**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. 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 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. Specialized variants (Fachgebundene Hochschulreife) allow for admission at Fachhochschulen (UAS), universities and equivalent higher education institutions, but only in particular disciplines. Access to study programmes at Fachhochschulen (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 vocational qualification 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 und HWK), staatlich geprüfte/r Betriebswirt/in, staatliche 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. [10] Higher Education Institutions may in certain cases apply additional admission procedures.

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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; Fax: +49[0]228/501-777; 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)

[1] The information covers only aspects directly relevant to purposes of the Diploma Supplement. All information as of January 2015.

[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] 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 21 April 2005).

[4] 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

[5] 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).

[6] Common structural guidelines of the Länder 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).

[7] "Law establishing a Foundation 'Foundation for the Accreditation of Study Programmes in Germany'", entered into force as from 26 February 2005, GV. NRW. 2005, No. 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 December 2004).

[8] See note No. 7.

[9] See note No. 7.

[10] 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).