Anlage zum Präsidiumsbeschluss RSO 562 vom 14.11.2016

FRANKFURT UNIVERSITY OF APPLIED SCIENCES

Prüfungsordnung
des Bachelor-Studiengangs

Electrical Engineering and Information Technology

Bachelor of Engineering (B.Eng.)
Fb 2:Informatik und Ingenieurwissenschaften–
Computer Science and Engineering

Wissen durch Praxis stärkt

Prüfungsordnung des Fachbereichs 2: Informatik und Ingenieurwissenschaften der Frankfurt University of Applied Sciences für den Bachelor-Studiengang Electrical Engineering and Information Technology (B.Eng.) vom 20.01.2016.

Aufgrund des § 44 Abs.1 Nr.1 des Hessischen Hochschulgesetzes (HHG) vom 14. Dezember 2009 hat der Fachbereichsrat des Fachbereichs 2: Informatik und Ingenieurwissenschaften der Frankfurt University of Applied Sciences am 20.01.2016 die nachstehende Prüfungsordnung für den Studiengang Electrical Engineering and Information Technology beschlossen. Die Prüfungsordnung entspricht den Allgemeinen Bestimmungen für Prüfungsordnungen mit den Abschlüssen Bachelor und Master an der Frankfurt University of Applied Sciences (AB Bachelor/Master) vom 10. November 2004 (Staatsanzeiger für das Land Hessen 2005 S. 519), zuletzt geändert am 12. November 2014 (veröffentlicht am 22.01.2015 auf der Internetseite in den amtlichen Mitteilungen der Frankfurt University of Applied Sciences) und ergänzt sie.

Die Prüfungsordnung wurde durch das Präsidium am 14. November 2016 gemäß § 37 Abs.5 HHG genehmigt.

Vorbemerkung

Die Studierenden des englischsprachigen Bachelor-Studiengangs Electrical Engineering and Information Technology (EEIT) sind an der Vietnamese-German University (VGU) und der Frankfurt University of Applied Sciences (FRA-UAS) reguläre Studierende. Die Struktur des sechssemestrigen Studiengangs EEIT entspricht hierbei im Wesentlichen dem deutsch-sprachigen Bachelor-Studiengang Elektrotechnik und Informationstechnik der FRA-UAS. (Prüfungsordnung vom 30.05.2007, zuletzt geändert am 21.01.2015). Der Studiengang Elektrotechnik und Informationstechnik ist bei der ASIIN akkreditiert bis 30.09.2017.

Die vietnamesischen Studierenden werden zunächst von der VGU zugelassen und eingeschrieben. Sie durchlaufen dann ein zweisemestriges „Foundation-Year“(FY), eine Art Studienkolleg, in dem sie auf den eigentlichen Studiengang EEIT vorbereitet werden und ein Praktikum durchführen sowie Deutsch- und Englischkurse belegen. Nach erfolgreichem Abschluss des Foundation-Years können sich die Studierenden der VGU in den Studiengang EEIT der Frankfurt University of Applied Sciences einschreiben. Näheres ist in dieser Prüfungsordnung geregelt. Die Veranstaltungen des Studiengangs werden an der VGU in Binh Duong Stadt, Vietnam, durchgeführt. Der Unterricht wird sowohl von vietnamesischen als auch von deutschen Lehrenden in englischer Sprache erteilt. Für die Durchführung der Lehrveranstaltungen ist die Frankfurt University of Applied Sciences zuständig. Die geforderten Prüfungsleistungen werden nach den Regeln dieser Prüfungsordnung erbracht. Die VGU stellt die notwendige Infrastruktur zur Durchführung der Lehrveranstaltungen zur Verfügung. Darin eingeschlossen ist ein freiwilliges Angebot weiterführender Deutschkurse, welche die Teilnehmenden befähigen, einen Studienaufenthalt in Deutschland durchzuführen. Die Frankfurt University of Applied Sciences erteilt das Zeugnis und verleiht die Bachelor-Urkunde mit dem akademischen Grad „Bachelor of Engineering“ (B.Eng.).

Inhaltsübersicht

Anlagen

§ 1
Akademischer Grad

(1) Das Studium qualifiziert für eine Tätigkeit als Ingenieurin oder Ingenieur in der Elektrotechnik und Informationstechnik sowie für den Übergang zu einem Master - Studiengang.

(2) Nach der bestandenen Bachelorprüfung verleiht die Frankfurt University of Applied Sciences den akademischen Grad „Bachelor of Engineering“ (B.Eng.).

§ 2
Regelstudienzeit, Credits, Unterrichtssprache

(1) Die Regelstudienzeit beträgt 6 Semester.

(2) Das gesamte Studium umfasst 180 ECTS-Punkte (Credits).

(3) Die Unterrichtssprache und Prüfungssprache ist Englisch.

§ 3
Zulassungsvoraussetzungen

(1) In den Studiengang kann eingeschrieben werden, wer an der Vietnamese-German University das Foundation Year erfolgreich absolviert hat und Englischkenntnisse von IELTS 6.0 nachweisen kann.

(2) Für das Studium wird ein Vorpraktikum von mindestens acht Wochen gefordert, das vor Aufnahme des Studiums erbracht werden muss.

(3) Für das Vorpraktikum gilt die Praktikumsordnung (Anlage 5).

§ 4
Module

(1) Der Studiengang umfasst 27 Module. Die Inhalte der Module, die Anzahl der jeweiligen ECTS-Punkte (Credits) sowie die jeweiligen Prüfungsleistungen ergeben sich aus den Modulbeschreibungen (Anlage 3).

(2) Die Voraussetzungen für die Zulassung zu einer Modulprüfung sind in der jeweiligen Modulbeschreibung geregelt (Anlage 3).

(3) Die Module werden in englischer Sprache erbracht, das heißt alle Lehrveranstaltungen und die Modulprüfungen werden in englischer Sprache durchgeführt.

§ 5
Prüfungsleistungen

(1) Die Art der Modulprüfungsleistung oder Modulteilprüfungsleistung ist in der jeweiligen Modulbeschreibung (Anlage 3) geregelt.

(2) Die Bearbeitungszeit einer schriftlichen Prüfungsleistung in Form von Klausurarbeiten beträgt mindestens 90 Minuten und höchstens 180 Minuten. Die Dauer der schriftlichen Prüfungsleistungen in den einzelnen Modulen ist in den Modulbeschreibungen geregelt (Anlage 3)

§ 6
Wiederholbarkeit von Prüfungsleistungen

(1) Nicht bestandene Modulprüfungsleistungen oder Modulteilprüfungsleistungen für die Module M1 bis M26 können zweimal wiederholt werden.

(2) Das Modul M27, Bachelor-Arbeit mit Kolloquium, kann nur einmal wiederholt werden.

(3) Bestandene Modulprüfungsleistungen oder Modulteilprüfungsleistungen können nicht wiederholt werden.

§ 7
Bachelor-Arbeit mit Kolloquium

(1) Die Bachelor-Arbeit mit Kolloquium umfasst 15 ECTS-Punkte (Credits). Die Zeit von der Ausgabe des Themas zur Bachelor Arbeit bis zur Abgabe der Bachelor-Arbeit beträgt 12 Wochen.

(2) Für die Zulassung zur Bachelor-Arbeit müssen die Module M1 bis einschließlich M24 erfolgreich abgeschlossen sein.

(3) Die Bachelor-Arbeit ist in englischer Sprache abzufassen. Der Prüfungsausschuss kann auf Antrag der Kandidatin oder des Kandidaten sowohl für die Bachelor-Arbeit als auch für das Kolloquium die deutsche Sprache zulassen.

(4) Die Bachelor-Arbeit ist in schriftlicher Form fristgerecht beim Prüfungsamt des Fachbereichs 2 in zwei gebundenen Ausfertigungen einzureichen und in elektronischer Form abzugeben. Die gebundenen Ausfertigungen können einem autorisierten Mitarbeiter der VGU übergeben werden, der sie dann an das Prüfungsamt des Fachbereichs 2 schickt. Die Bachelor-Arbeit, gegebenenfalls mit Quellprogramm-dateien, ausführbaren Dateien oder sonstigen Dateien, ist auf einem zeitgemäßen Medium in elektronischer Form beizufügen. Das Abgabedatum wird aktenkundig gemacht.

(5) Kann der erste Abgabetermin aus Gründen, welche die Studierende oder der Studierende nicht zu vertreten hat, nicht eingehalten werden, so wird die Bearbeitungszeit nach Maßgabe des §25 Abs.8 S.1 AB Bachelor/Master um die Zeit der Verhinderung, längstens jedoch um einen Monat, verlängert.

(6) Bei unterschiedlicher Bewertung der Bachelor-Arbeit wird von der Vorsitzenden oder dem Vorsitzenden des Prüfungsausschusses die Note aus dem arithmetischen Mittel der Einzelnoten gebildet. Der Prüfungsausschuss holt die Stellungnahme einer dritten Prüferin oder eines dritten Prüfers ein, wenn die Beurteilungen der Prüfenden um mehr als 2,0 voneinander abweichen oder wenn eine oder einer der Prüfenden die Bachelor- Arbeit als "nicht ausreichend" beurteilt. Die Note wird in diesem Fall aus den Noten der Erstprüferin oder des Erstprüfers, der Zweitprüferin oder des Zweitprüfers und der Drittprüferin oder des Drittprüfers aus dem arithmetischen Mittel der Einzelnoten gebildet.

(7) Die Bachelor-Arbeit ist im Rahmen eines Bachelor-Kolloquiums vorzustellen. Das Kolloquium setzt das Bestehen der Bachelor-Arbeit voraus und findet vor zwei Prüferinnen oder Prüfern statt. Das Bachelor-Kolloquium findet innerhalb von 4 Wochen nach Abgabe der Bachelorarbeit statt. Die Dauer des Kolloquiums beträgt mindestens 30 Minuten und maximal 60 Minuten.

(8) Das Kolloquium ist in der Regel öffentlich. Soweit die Kandidatin oder der Kandidat bei der Meldung zur Prüfung nicht widersprochen hat oder die Bachelor-Arbeit nicht der Geheimhaltungspflicht unterliegt, ist bei dem Bachelor-Kolloquium die Öffentlichkeit zugelassen. Die Durchführung des Kolloquiums darf durch die Öffentlichkeit nicht beeinträchtigt werden. Die Öffentlichkeit erstreckt sich nicht auf die Beratung und Bekanntgabe des Prüfungsergebnisses an die Kandidatin oder den Kandidaten.

(9) Die Note des Moduls “Bachelor-Arbeit mit Kolloquium” berechnet sich zu 8/10 aus der Note der Bachelor-Arbeit und zu 2/10 aus dem Ergebnis des Kolloquiums. Bachelor-Arbeit und Kolloquium müssen jeweils mit mindestens „ausreichend“ bewertet worden sein.

§ 8
Bildung der Gesamtnote

(1) Für das Bachelor-Zeugnis wird eine Gesamtnote gebildet. Die Gesamtnote der Bachelor-Prüfung errechnet sich aus der Summe der Produkte der Noten der einzelnen Module M1 bis M27 mit ihren Gewichtungsfaktoren gemäß der Modulübersicht (Anlage2).

(2) Für die Gesamtnote wird ein ECTS-Rangvergeben.

§ 9
Zeugnis, Urkunde und Diploma Supplement

(1) Nach bestandener Bachelor-Prüfung erhält die Studierende oder der Studierende ein Zeugnis, die Bachelor-Urkunde und ein Diploma Supplement nach Maßgabe des §23 der AB Bachelor/Master.

(2) Auf Antrag der Studierenden oder des Studierenden ist das Ergebnis der Prüfungen in Zusatzmodulen in das Zeugnis aufzunehmen.

§ 10
Inkrafttreten und Übergangsregelungen

(1) Diese Prüfungsordnung tritt am Tag nach der Veröffentlichung in den Amtlichen Mitteilungen auf der Internetseite der FRA-UAS mit Wirkung zum Wintersemester 2016/2017 in Kraft.

(2) Studierende, die ihr Studium in diesem Studiengang vor dem 1. Oktober 2016 nach einer früheren Prüfungsordnung begonnen haben, können auf Antrag ihr Studium nach dieser Prüfungsordnung fortsetzen oder noch bis zum Ende der Regelstudienzeit, spätestens bis zum 30. September 2018, Prüfungen nach ihrer bisherigen Prüfungsordnung ablegen. Näheres regelt der Prüfungsausschuss.

Frankfurt am Main,_____

Prof. Achim Morkramer
Dekan des Fachbereichs 2:
Informatik und Ingenieurwissenschaften – Computer Science and Engineering
Frankfurt University of Applied Sciences

Strukturmodell EEIT

- Anlage 1 zur PO -

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08.10.2016</td><td>ECTS
Punkte
(cp)</td></tr>
<tr><td>Semester 6</td><td>M25 Technical Writing
(5 cp)</td><td colspan="2">M26 Senior Project
(10 cp)</td><td colspan="3">M27 Bachelor-Thesis with Colloquium
(15 cp)</td><td>30</td></tr>
<tr><td>Semester 5</td><td>M20 Communications Engineering
(5 cp)</td><td>M21 Digital Routing
(5 cp)</td><td>M22 Digital Systems
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(10 cp)</td><td>M23 Radio Frequency Engineering
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<tr><td>Semester 4</td><td>M14 Industrial Business Management
(5 cp)</td><td rowspan="2">M10 Electronics
(10 cp)</td><td>M15 Fundamentals of Tele-communications
(5 cp)</td><td>M17 Embedded Intelligent Systems
(5 cp)</td><td>M18 Signals and Systems
(5 cp)</td><td>30</td></tr>
<tr><td>Semester 3</td><td>M6 Electrical Engineering Materials
(5 cp)</td><td>M11 Digital Circuit Design
(5 cp)</td><td>M12 Microcontroller
(5 cp)</td><td>M13 Digital Signal Processing
(5 cp)</td><td>M19 Fundamentals of Power Engineering
(5 cp)</td><td>30</td></tr>
<tr><td>Semester 2</td><td>M5 Advanced Engineering Mathematics
(5 cp)</td><td>M8 High-Level Programming
(5 cp)</td><td rowspan="2">M2 Experimental Physics
(10 cp)</td><td colspan="2">M7 Electromagnetics
(10 cp)</td><td>M9 Electrical Measurement and Instrumentation
(5 cp)</td><td>30</td></tr>
<tr><td>Semester 1</td><td colspan="2">M1 Fundamentals of Engineering Mathematics
(10 cp)</td><td colspan="2">M3 Electric Circuits
(10 cp)</td><td>M4 Engineering Design
(5 cp)</td><td>30</td></tr>
</table>

Modulübersicht EEIT

- Anlage2 zur Prüfungsordnung-

(Semester–Module–ECTS–Dauer–Lehrform–Prüfungsform–Sprache d. Moduls–SWS-Gewichtung)

Sem.	Modultitel	ECTS	Dauer [Sem]	Lehrformen	Prüfungsform	Sprache	SWS	Gewich-tung
1	M1 Fundamentals of Engineering Mathematics	10	1	Vorlesung, Übung	Klausur 120 Minuten	Englisch	8	2/36
1 + 2	M2 Experimental Physics	10	2	Vorlesung, Labor	Klausur 120 Minuten	Englisch	10	2/36
1	M3 Electric Circuits	10	1	Vorlesung, Übung	Klausur 120 Minuten	Englisch	8	2/36
1	M4 Engineering Design	5	1	Vorlesung, Übung	Projektarbeit 4 Wochen	Englisch	4	1/36
2	M5 Advanced Engineering Mathematics	5	1	Vorlesung, Übung	Klausur 90 Minuten	Englisch	5	1/36
3	M6 Electrical Engineering Materials	5	1	Vorlesung,Übung	Klausur 90 Minuten	Englisch	4	1/36
2	M7 Electromagnetics	10	1	Vorlesung, Übung	Klausur 120 Minuten	Englisch	8	2/36
2	M8 High-Level Programming	5	1	Vorlesung, Übung	Klausur 90 Minuten	Englisch	4	1/36
2	M9 Electrical Measurement and Instrumentation	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	5	1/36
3+ 4	M10 Electronics	10	2	Vorlesung, Labor	Klausur 120 Minuten	Englisch	10	2/36
3	M11 Digital Circuit Design	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	5	1/36
3	M12 Microcontroller	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
3	M13 Digital Signal Processing	5	1	Vorlesung, Übung	Klausur 90 Minuten	Englisch	5	1/36

4	M14 Industrial Business Management	5	1	Vorlesung, Übung	Projektarbeit 4 Wochen	Englisch	4	1/36
4	M15 Fundamentals of Telecommunications	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
4+5	M16 Control Engineering	10	2	Vorlesung, Labor	Klausur 120 Minuten	Englisch	8	2/36
4	M17 Embedded Intelligent Systems	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
4	M18 Signals and Systems	5	1	Vorlesung, Übung	Klausur 90 Minuten	Englisch	4	1/36
3	M19 Fundamentals of Power Engineering	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
5	M20 Communications Engineering	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
5	M21 Digital Routing	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
5	M22 Digital Systems	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
5	M23 Radio Frequency Engineering	5	1	Vorlesung, Labor	Klausur 90 Minuten	Englisch	4	1/36
5	M24 Special Topics in Electrical Engineering	5	1	Vorlesung, Übung	Klausur 90 Minuten	Englisch	4	1/36
6	M25 Technical Writing	5	1	Vorlesung, Übung	Projektarbeit 4 Wochen	Englisch	4	1/36
6	M26 Senior Project	10	1	Projekt	Projektarbeit 8 Wochen	Englisch	1	2/36
6	M27 BachelorThesiswith Colloquium	15	1	Selbständig Arbeiten	Bachelor-Arbeit 12 Wochen, Kolloquium	Englisch	2	3/36

Appendix 3: Module Description

Modulbeschreibungen für Studiengang Electrical Engineering and Information Technology

Module title	**Fundamentals of Engineering Mathematics**
Module number	01
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	1st Semester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 120 minutes)
Intended learning outcomes /acquired competences of the module	The students are able to apply their basic knowledge of mathematics to relevant technical issues. They develop their analytical skills and the ability to deal with mathematical abstractions.
Contents of the module	Lecture Fundamentals of Engineering Mathematics Tutorial Fundamentals of Engineering Mathematics
Teaching methods of the module	Lecture and tutorial
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Experimental Physics**
Module number	02
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	2 semesters
Status of the module	Compulsory module
Recommended semester during the study program	1st and 2nd semester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	3 attested reports of laboratory exp. phys. 1 (workload 30 h) 3 attested reports of laboratory exp. phys. 2 (workload 30 h)
Module examination	Written examination (duration: 120 minutes)
Intended learning outcomes /acquired competences of the module	The students know and understand the basic concepts of technical physics with an underlying focus on practical experiments. They will gain a thorough understanding of the processes of abstraction stretching from the relevant identification up to the formal implementation and calculation. They are able to implement the approaches of physical concepts in the laboratory (team work, interpersonal skills).
Contents of the module	Lecture Experimental Physics 1 Tutorial Experimental Physics 1 Laboratory Experimental Physics 1 Lecture Experimental Physics 2 Tutorial Experimental Physics 2 Laboratory Experimental Physics 2
Teaching methods of the module	Lecture, tutorial and laboratory
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Winter and Summer semester

Appendix 3: Module Description

Module title	**Electric Circuits**
Module number	03
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	1st semester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 120 minutes)
Intended learning outcomes /acquired competences of the module	The students are able to systematically design circuits. They know modern development methods for circuit design. The students acquire skills in teamwork and are prepared for methodical working and presentation techniques.
Contents of the module	Lecture Electric Circuits Tutorial Electric Circuits
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Engineering Design**
Module number	04
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	1st semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Project (4 weeks)
Intended learning outcomes /acquired competences of the module	The students are able to design systematically electro - mechanical systems and to use and prepare technical documentation. They gain substantial knowledge of modern development methods including schedule planning and cost efficiency. The students acquire interdisciplinary skills. They are able to work in teams and are prepared for methodical working and have gained presentation knowledge.
Contents of the module	Lecture and Tutorial Engineering Design
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Advanced Engineering Mathematics**
Module number	05
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	2nd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students have a deeper insight and broader mathematical skills in advanced mathematics. The students are able to solve mathematical-technical assignments using algebraic and analytical methods including the calculus of functions of several variables. They develop analytical skills and the ability to apply theoretical knowledge to practical questions.
Contents of the module	Lecture Advanced Engineering Mathematics Tutorial Advanced Engineering Mathematics
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Electrical Engineering Materials**
Module number	06
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	3rdsemester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students know the basics and principles of model-based mechanical, electrical, magnetic and thermal behaviour in the three groups of solid-states: metals, semiconductors and isolators as well as superconductors. The students will have an appreciation of the ways in which these various materials are exploited to produce electronic components (e. g. diode, transistors). Upon completion of this module, the students will have knowledge for calculating the material properties by means of underlying physical models
Contents of the module	Lecture Electrical Engineering Materials Tutorial Electrical Engineering Materials
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Electromagnetics**
Module number	07
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	2nd semester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 120 minutes)
Intended learning outcomes /acquired competences of the module	Students know the basics and principles electrostatic and magnetic fields as well as of electromagnetic fields. Upon completion of this module, the students will have knowledge for calculating the field properties by means of underlying physical models
Contents of the module	Lecture Electromagnetics Tutorial Electromagnetics
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**High-Level Programming**
Module number	08
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	2nd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration 90 minutes)
Intended learning outcomes /acquired competences of the module	Upon completion of the module students are able to develop problem solutions und to implement them in a high-level programming language. They can master the most important elements and library functions of a high-level programming language. They know methods for detecting and debugging errors.
Contents of the module	Lecture in High-Level Programming Language Tutorial in High-Level Programming Language
Teaching methods of the module	Lecture and tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Electrical Measurement and Instrumentation**
Module number	09
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	2nd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory measurement and instrumentation (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	The students have knowledge of the "measurement and instrumentation" in theory and practice. They can use and apply measurement instruments. They are able to analyze the measurement results and present them in a coherent manner. The students have acquired skills in teamwork and are prepared for working and presentation techniques. The students know safety rules for working in laboratories which is documented in a laboratory course attestation
Contents of the module	Lecture Electrical Metrology and Instrumentation Laboratory Electrical Metrology and Instrumentation
Teaching methods of the module	Lecture combined laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Electronics**
Module number	10
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	2 semesters
Status of the module	Compulsory module
Recommended semester during the study program	3rd and 4thsemester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory electronics (workload 30h)
Module examination	Written examination (120 minutes)
Intended learning outcomes /acquired competences of the module	Students learn basic concepts of the use of electronic components and their description in electronic simulation programs. They are able to design and dimension electronic circuits. They have enhanced knowledge and understanding of the operation characteristics of analog and digital switching circuits. They can solve problems emerging between analog and digital switching circuits and the application of simulation tools. The students acquire skills in teamwork and are prepared for working and presentation techniques.
Contents of the module	Lecture Electronics 1 Lecture Electronics 2 Laboratory Electronics
Teaching methods of the module	Lecture combined with tutorial and laboratory
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Summer and Winter semester

Appendix 3: Module Description

Module title	**Digital Circuit Design**
Module number	11
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	3rd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory digital circuit design (workload 30 h)
Module examination	Written examination (90 min.)
Intended learning outcomes /acquired competences of the module	Students have the ability to analyze and design digital circuits. They know and understand various design techniques associated with the digital technology, fundamental knowledge about programmable logic devices. The students acquire skills in teamwork and are prepared for methodical working and presentation techniques
Contents of the module	Lecture in Digital Circuit Design Exercise Course in Digital Circuit Design Laboratory Course in Digital Circuit Design
Teaching methods of the module	Lecture, exercises and laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Microcontroller**
Module number	12
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	3rd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory microcontrollers (workload 30 h)
Module examination	Written examination (90 minutes)
Intended learning outcomes /acquired competences of the module	The students gain enhanced knowledge of the working principles and design of microcomputers. The students know the hardware architecture of microcontrollers and one hardware oriented high-level programming language. The knowledge is reinforced in the laboratory exercises of typical application fields to enable the student to develop microprocessor-controlled systems. The students acquire skills in teamwork and are prepared for working and presentation techniques.
Contents of the module	Lecture on microcontroller Laboratory course on microcontroller
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Digital Signal Processing**
Module number	13
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	3rd semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (90 minutes)
Intended learning outcomes /acquired competences of the module	Upon completion of this module, the students will have a basic knowledge of “Digital Signal Processing”. They are able to realize DSP systems including recording and evaluation of the signals. They are able to analyse and synthetises digital signals in time- and frequency domains.
Contents of the module	Lecture Digital Signal Processing Tutorial Digital Signal Processing
Teaching methods of the module	Lecture and tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Industrial Business Management**
Module number	14
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	4th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Project (4 weeks)
Intended learning outcomes /acquired competences of the module	Students are able to manage the development and use of information technology in organizations. They possess a thorough understanding of information technology and also the knowledge to use that technology to support core business functions of an organization. Students have an understanding of how to create strategies for an organization and how to transform these strategies in operational management. Students have knowledge of foreign languages, human resource management, information management, computer techniques, project management, implementing of change process and system planning.
Contents of the module	Lecture Industrial Business Management
Teaching methods of the module	Lecture
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Fundamentals of Telecommunications**
Module number	15
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	4th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory Fundamentals in Telecommunication (workload 30 h)
Module examination	Written examination (90 minutes)
Intended learning outcomes /acquired competences of the module	Students are familiar with the principles and methods of communication and routing technologies. They know the issues relating to modern communications systems and technologies.They have knowledge in software solutions including issues from the field of communication technology. The students acquire skills in teamwork, project and time management, leading negotiations, self-assurance and are prepared for methodical working and presentation techniques
Contents of the module	Lecture Fundamentals of Telecommunication Software Project Fundamentals in Telecommunication
Teaching methods of the module	Lecture combined with project
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Control Engineering**
Module number	16
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	2 semesters
Status of the module	Compulsory module
Recommended semester during the study program	4th and 5thsemester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory control engineering (workload 30 h)
Module examination	Written examination (120 minutes)
Intended learning outcomes /acquired competences of the module	Students are able to analyse and design control systems, especially with respect to the analysis of dynamic systems and the design of digital control loops. They have acquired skills in teamwork, in leading negotiations and presentation techniques.
Contents of the module	Lecture Control Engineering 1 Lecture Control Engineering 2 Laboratory Control Engineering
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Summer and Winter semester

Appendix 3: Module Description

Module title	**Embedded Intelligent Systems**
Module number	17
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	4th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory Embedded Intelligent Systems (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students become acquainted with the structure and function of embedded intelligent systems. The students will have a comprehensive knowledge of hardware design and programming of the most important features in C; the topics include the recording and processing of analog and digital data, response to interrupt and scheduled events, data transfer via interfaces, data display on LC displays, control of the actuators. They will be familiar with a range of intelligent and adaptive algorithms and demonstrate practical skills in implementing a range of embedded systems. The students acquire skills in teamwork, project and time management and presentation techniques.
Contents of the module	Lecture Embedded Intelligent Systems Laboratory Embedded Intelligent Systems
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Signals and Systems**
Module number	18
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	4th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	The students will gain in-depth knowledge of processing digital signals involved in the communication and control technology. After completing this course, the students should be able to select problem-specific filter design processes and to complete digital filters taking into account the respective hardware limitations. The students will be able to design and implement signals, including signal detection and to assess the parameter of discrete linear time-invariant processes using the LS method.
Contents of the module	Lecture Signal and Systems Tutorial Signals and Systems
Teaching methods of the module	Lecture and tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Fundamentals of Power Engineering**
Module number	19
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	3rdsemester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory Fundamentals in Power Engineering (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students understand the basic aspects of electromagnetic power system operation and control, under both steady-state and rotating conditions and their influence on the operating conditions. They achieve knowledge of the functioning conditions, operating behaviour and interaction of energy supply equipment. They understand the appropriate application of power electronic devices and measuring equipment. The students acquire skills in teamwork, land presentation techniques.
Contents of the module	Lecture Fundamentals in Power Engineering Laboratory Power Engineering
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Communications Engineering**
Module number	20
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	5thsemester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of Laboratory Communications Engineering (workload 75 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students know the basics, principles and methods of the transmission technology. They understand modern transmission systems and telecommunication networks. The students are able to identify and apply the most appropriate method for calculation and design of linear time invariant communication systems and their output signals and the appropriate basic modulation scheme.
Contents of the module	Lecture Communications Engineering Laboratory Communications Engineering
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Digital Routing**
Module number	21
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	5th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory digital routing (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students know the fundamentals, principles and methods of the routing technology. They understand the fundamentals of modern routing systems and telecommunication networks. Students have developed skills in routing technology and are prepared for methodical working within a team and know presentation techniques.
Contents of the module	Lecture Digital Routing Laboratory Digital Routing
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Digital Systems**
Module number	22
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	5th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory digital signals and systems (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students know the technology of sequential circuits and have a comprehensive understanding of the main design methods of finite state machines. The students gain an understanding of designing hazard-free circuits including fault detection and testability analysis and are able to achieve a functioning model and a working PLD or FPGA. The students acquire skills in teamwork, project and time management, are prepared for methodical working and know presentation techniques.
Contents of the module	Lecture Digital Signals and Systems Laboratory Digital Signals and Systems
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Radio Frequency Engineering**
Module number	23
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	5th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	Attested reports of laboratory RF-engineering (workload 30 h)
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students are able to understand and describe the propagation of electromagnetic waves on transmission lines and free space. Appreciation of the circuit concept for the realization of high frequency circuits. Dimensioning of simple systems of transmitter-receiver. The students acquire skills in teamwork, project and time management, leading negotiations, self-assurance and are prepared for methodical work and presentation techniques
Contents of the module	Lecture Radio Frequency (RF)-Engineering Laboratory Radio Frequency (RF)-Engineering
Teaching methods of the module	Lecture combined with laboratory
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Special Topics in Electrical Engineering**
Module number	24
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	5th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Written examination (duration: 90 minutes)
Intended learning outcomes /acquired competences of the module	Students have acquired basic knowledge in an area of latest's development or high importance in Electrical Engineering.
Contents of the module	Lecture in Special Topics in Electrical Engineering Tutorial in Special Topics in Electrical Engineering
Teaching methods of the module	Lecture combined with tutorial
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Winter semester only

Appendix 3: Module Description

Module title	**Technical Writing**
Module number	25
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	6th semester
Credit points (Cp) of the module	5
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Project report and project presentation (15 - 30 min)
Intended learning outcomes /acquired competences of the module	Students have acquired skills to conduct research. They know how to write scientific reports.
Contents of the module	Lecture Methods of Research and Technical Writing
Teaching methods of the module	Lecture combined with project (4 weeks)
Total workload (h) of the module	150 h
Language	English
Frequency of the module	Summer semester only

Appendix 3: Module Description

Module title	**Senior Project**
Module number	26
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	6th semester
Credit points (Cp) of the module	10
Prerequisites for module participation	None
Prerequisites for module examination	None
Module examination	Project report
Intended learning outcomes /acquired competences of the module	On completion of the module the student has gathered hands - on experience on how to explore literature and how to conduct research in order to achieve the goal of a project. He knows how to document his results and how to write a project report.
Contents of the module	Senior Project
Teaching methods of the module	Project (4 weeks) combined with contact hours for project guidance. The contact hours can be by presence or by means of distant learning tools.
Total workload (h) of the module	300 h
Language	English
Frequency of the module	Winter and Summer semester

Appendix 3: Module Description

Module title	**Bachelor Thesis with Colloquium**
Module number	27
Study program	Electrical Engineering and Information Technology
Applicability of the module to other study programs	
Duration of the module	1 semester
Status of the module	Compulsory module
Recommended semester during the study program	6th semester
Credit points (Cp) of the module	15
Prerequisites for module participation	Module 1 to 24
Prerequisites for module examination	Module 1 to 26
Module examination	Written Bachelor Thesis (12 weeks, weight 80%) and Colloquium (30-45 minutes, weight20%)
Intended learning outcomes /acquired competences of the module	Students have acquired sufficient proficiency in technical and interdisciplinary topics for the purpose of working as an engineer. Students are prepared for technical working, leading communication, effective communication in business meetings and negotiations, presentation techniques, project management, conflict management, planning of new systems, networked thinking, creativity and transferability.
Contents of the module	Bachelor Thesis with Colloquium
Teaching methods of the module	Bachelor Thesis
Total workload (h) of the module	450 h
Language	English
Frequency of the module	Winter and Summer semester

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 / 1.2 First Name

«Nachname», «Vorname»

1.3 Date, Place, Country of Birth

«Gebdat», «Gebort», «Gebland»

1.4 Student ID Number or Code

«mtknr»

2. QUALIFICATION

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

Bachelor of Engineering, B.Eng.

2.2 Main Field(s) of Study

Electrical Engineering and Information Technology

2.3 Institution Awarding the Qualification (in original language)

Frankfurt University of Applied Sciences

Status (Type / Control)
University of Applied Sciences / State Institution

2.4 Institution Administering Studies (in original language)

(same)
Status (Type / Control)
(same)

2.5 Language(s) of Instruction / Examination

English

3. LEVEL OF QUALIFICATION

3.1 Level

First degree (3 years), including thesis

3.2 Official Length of Programme

3 years, 180CP

3.3 Access Requirements

General or specialized Higher Education Entrance Qualification (HEEQ), cf. Sect.8.7., or foreign equivalent.

4. CONTENTS AND RESULTS GAINED

4.1 Mode of study

Full time

4.2 Programme Requirements / Qualification Profile of the Graduate

The aims and objectives are as follows:

(a) The graduate is competent and qualified to think in a multi- and interdisciplinary way when applying laws and principles of engineering sciences in order to solve challenging and complex technical problems, particularly in reference to the development of new technologies, products and services.
(b) The graduate acquired a wide knowledge base both in mathematical, natural science disciplines (mathematics, experimental physics) and in engineering sciences (electrical engineering, electronics, computer engineering, digital technology, control systems, information technology, and automation technology).
(c) The graduate is able to apply modern business administration methods and has key competences in technical English, in intercultural communication, in social interaction (team work, practical placement) and in professional presentation and communication at his/her disposal.
(d) The graduate is familiar with new technologies in the field of electrical engineering and their application.
(e) He/she is prepared for lifelong learning and will be able to obtain higher academic degrees.

4.3 Programme Details

See "Transcript of records" for list of courses and grades, and "Prüfungszeugnis" (Final Examination Certificate) for subjects offered in final examinations (written and oral), and topic of thesis, including evaluations.

4.4 Grading Scheme

General grading scheme cf. Sec. 8.6

4.5 Overall Classification (in original language)

Individuell: sehr gut; gut; befriedigend; ausreichend

Based on the accumulation of grades received during the study programme and final thesis.

cf. Bachelorzeugnis (Final Examination Certificate)

5. FUNCTION OF THE QUALIFICATION

Appendix 3: Module Description

5.1 Access to Further Study

Qualifies to apply for admission for Master studies

5.2 Professional Status

The degree entitles the holder to electrical engineering functions in companies and private and state institutions.

6. ADDITIONAL INFORMATION

6.1 Additional Information

6.2 Further Information Sources

On the institution: www.frankfurt-university.de

Hessisches Ministerium für Wissenschaft und Kunst (State Ministry), www.hmwk.hessen.de, Rheinstraße 23-25, D-65185 Wiesbaden

For national information sources cf. Sect. 8.8

7. CERTIFICATION

This Diploma Supplement refers to the following original documents:

- Urkunde über die Verleihung des Bachelor/Master-Grades vom «PrDatumL»
- Prüfungszeugnis vom «PrDatumL»
- Transcript of Records of «PrDatumL» (wenn es das gibt)

(Official Stamp/ seal)

Certification Date: «PrDatumL»

_____

Prof. XYZ

Chairman Examination Committee

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.

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 becoming 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 in parallel 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.

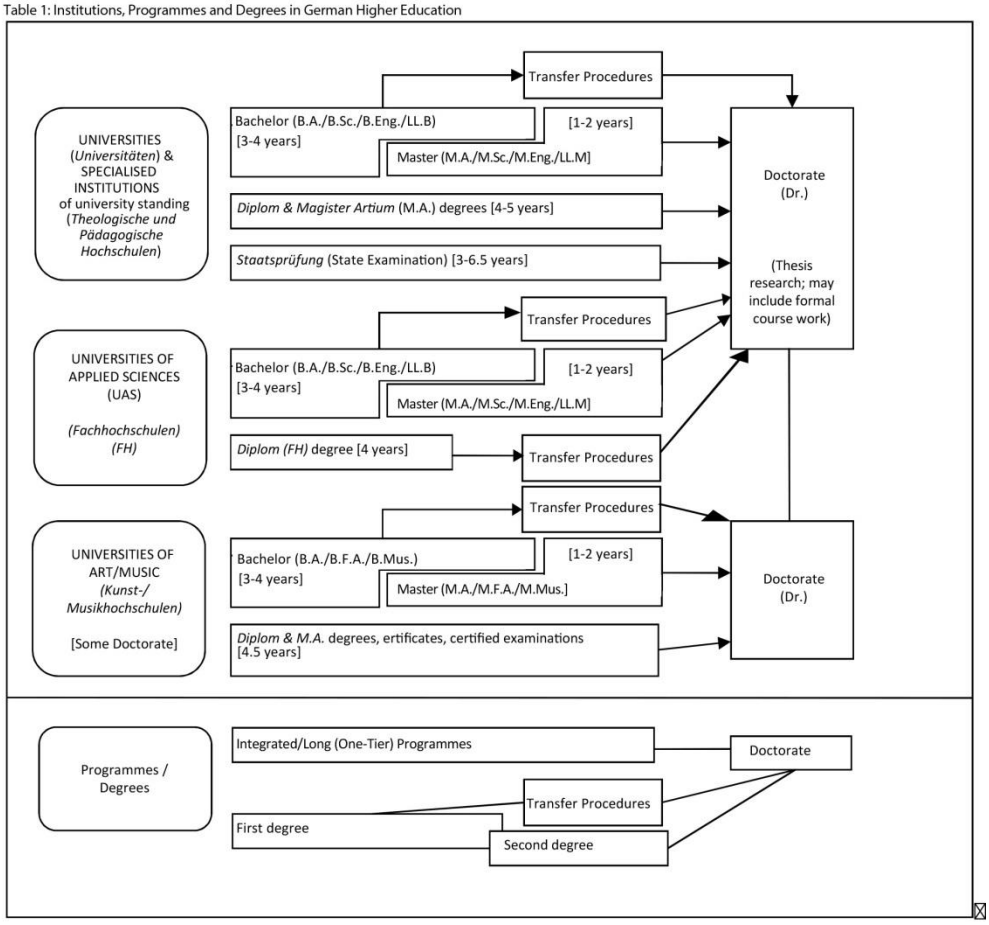
The German Qualifications Framework for Higher Education Degrees[3], the German Qualifications Framework for Lifelong Learning[4] and the European Qualifications Framework for Lifelong Learning[5] describe the degrees of the German Higher Education System. They contain the classification of the qualification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

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



8.2 Types of Programmes and Degrees Awarded

Appendix 3: Module Description

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.[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.), Bache lor 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.

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 apti tude. 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.

8.5 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 (*Fachgebundende 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 *Fachgebundende 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.

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; Tel.: +49(0)228/501-0; Fax: +49(0)228/501-777
- 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/deutsche-eurydice-stelle-der-laender.html)
- *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 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).