Study and Examination Regulations
For the Bachelor’s Programme in Mechatronics
At the University of Applied Sciences
Würzburg-Schweinfurt
(SPO BIMC – engl.)

From 19 November 2019

The Bavarian Higher Education Act (BayHschG) forms the framework for the following regulations decreed by the University of Applied Sciences Würzburg-Schweinfurt (FHWS).

Contents

1. General information
   § 1 Purpose of the study and examination regulations
   § 2 Objective of the programme
   § 3 Conditions for admission to the programme

2. Programme structure
   § 4 Standard time to degree and start of the programme
   § 5 Programme structure and modules
   § 6 Internship Module

3. Examinations and deadlines
   § 7 Supplementary regulation for other types of assessments
   § 8 Bachelor’s thesis
   § 9 Standard deadlines

4. Organisational Matters
   § 10 Examination Committee

5. Academic degree, concluding provisions
   § 11 Academic degree
   § 12 Coming into effect, expiration
   § 13 Transitional provisions
1. General Information

§ 1 Purpose of these Study and Examination Regulations

¹These study and examination regulations govern the course of the bachelor’s programme Mechatronics. ²They serve to complete and supplement the General Examination Regulations for Universities of Applied Sciences (RaPO) of 17 October 2001 (GVBl p. 686), as amended by the amending regulation of 6 August 2010 (GVBl p. 688) and the General Examination Regulations of the University of Applied Sciences Würzburg-Schweinfurt (APO) of 28 January 2019 in their current version.

§ 2 Programme Objective and Profile

(1) ¹Through practice-oriented teaching, the objective of the English-language degree programme is to develop the students’ ability to independently apply scientific findings and to teach techniques of mechatronics. ²Graduates are to work independently and with scientific methods as mechatronics engineers. ³Due to the range and diversity of mechatronics, which makes necessary a comprehensive fundamental training, the programme wants to develop professional, methodological and social competences so graduates will be able to familiarise themselves quickly with one of the many areas of application and so to exercise the profession of engineers.

(2) By offering optional modules, students can choose courses according to their preferences and career expectations; this, however, does not lead to specialisation.

(3) ¹To support personality formation, students not only acquire professional expertise, but also social skills and foreign language proficiency. ²This ensures their practical problem-solving skills also in an international context and students are being prepared to take over management tasks themselves.

§ 3 Conditions for Admission to the Programme

(1) ¹Admission to the bachelor’s programme Mechatronics is conditional upon evidence of

a) a general higher education entrance qualification,

b) an entrance qualification for a university of applied sciences (Fachhochschulreife) or

c) a higher education entrance qualification in terms of Article 45 of the Bavarian Higher Education Act of 23 May 2006 (GVBl, p. 245, BayRS 2210-1-1-WFK) in its current version.

²Evidence of the existence of the condition under Sentence 1 a) to c) is provided in accordance with the Regulation Concerning Eligibility for Studying at the Universities of the Free State of Bavaria and the State-recognised Private Universities of 2 November 2007 (GVBl p. 767) in its current version.

(2) Other conditions for admission to the programme (in particular with regard to the student’s linguistic aptitude for the programme) and for enrolment arise out of the Regulations for the Procedure of Enrolment, Leave of Absence, and Termination of Enrolment at the University of Applied Sciences Würzburg-Schweinfurt (FHWS Enrolment Regulations) in its current version.

(3) ¹In addition to the conditions under (1), evidence must be provided of practical experience of at least six weeks that is appropriate for the bachelor’s programme Mechatronics (pre-study internship). ²The pre-study internship must fulfil the following subject-specific requirements:
The pre-study internship will provide insights into technical and organisational connections of the production process as well as to offer experience in the operational working environment and with the social structures of the company.

The pre-study internship will provide basic knowledge and skills, for example, in the areas of manufacturing, assembling or maintaining technical systems.

³The pre-study internship is preferably to be completed continuously and before the start of studies. ⁴The pre-study internship can be made up until the end of the second programme semester. ⁵The pre-study internship should be completed in a company or another appropriate institution.

2. Programme Structure

§ 4 Standard Time to Degree and Start of the Programme

(1) The standard time to degree is seven semesters with a total of 210 credit points in accordance with the European Credit Transfer and Accumulation System (ECTS, hereinafter referred to as ECTS credits).

(2) The programme begins in the winter semester.

§ 5 Programme Structure and Modules

(1) ¹The programme structure is determined by the appendix to these study and examination regulations.

(2) ¹Core Electives (FWPM) in accordance with § 7 (3) APO serve the development of advanced competencies; therefore, they have an immediate thematic relation to other modules of the bachelor’s programme Mechatronics. ²Each student has to select Core Electives with a total of 20 ECTS credits (two Core Electives with 10 ECTS credits each). ³Modules with the best grades up to the total of ECTS credits mentioned above are included in the calculation of the degree grade, unless the student makes a different binding selection to the Department of Student Affairs (HSST) before the degree certificate is issued. ⁴The catalogue of Core Electives is determined by the Faculties of Mechanical Engineering and the Faculty of Electrical Engineering. ⁵Offered modules include classes from the area of automotive engineering, power engineering, electric mobility, communication technology and network engineering, automation and robotics, measurement and test technology, heat and fluid engineering, material science and engineering, and other disciplines of electrical engineering, mechanical engineering, and computer science. ⁶Choice is made by taking a Core Elective’s exam for the first time.

§ 6 Internship Module

(1) ¹The internship module consists of a continuous, supervised internship lasting at least 20, but no more than 26 weeks. ²In accordance with § 2 (2) Sentence 2 RaPO, the Internship Module is prepared by or accompanied by the module Practice-Related Courses.

(2) Only students who have gained 90 ECTS credits at the start of the Internship Module are entitled to enter this part of studies.

(3) The Internship Module is assessed at 24 ECTS credits and the grade “passed successfully” or “failed”.
3. Examinations, Deadlines, Academic Degree

§ 7 Supplementary Regulation for Other Types of Assessments (sonstige Prüfungsleistungen)

(1) ¹The topic set for the Engineering Project should be such that the essential content of the assignment can be described in a documentation report of 20 to 80 pages. ²Only students who have earned at least 90 ECTS credits may start working on their Engineering Project. ³While working on the Engineering Project, the progress is to be recorded by the signature of the Engineering Project's supervisor and proven upon the project's submission (Testate). ⁴After the Engineering Project is submitted, the work is presented by the student in accordance with § 26 (4) APO.

(2) ¹In deviation from § 27 (1) Sentence 3 APO, a documentation report is a written compilation of all the information related to the assigned topic in the range of 10 to 15 pages. ²In deviation from § 27 (1) Sentence 5 APO, a written assignment/term paper has 10 to 30 pages. ³To substantiate § 27 (1) Sentence 6 APO, a portfolio assignment is a written summary in the range of 10 to 15 pages or a summary delivered orally in 10 to 20 minutes.

§ 8 Bachelor's Thesis

(1) ¹Students may start work on their bachelor's thesis not before
a) the Internship Module and also the module Control Systems 1 have been passed successfully, as well as
b) at least 150 ECTS credits have been earned.
²Exceptions may be approved by the examination committee.

(2) The topic set should be such that the thesis can generally be completed within a period of ten weeks if it is worked on continuously to the exclusion of everything else.

§ 9 Standard deadlines

(1) The following examinations are considered to be for foundation modules in the meaning of § 39 (1) Sentence 1 APO
- Engineering Mathematics 1 as well as
- Physics

and must be taken for the first time no later than by the end of the second programme semester.

(2) ¹Any examination for modules scheduled for the first two semesters (according to the appendix of these Study and Examination Regulations) with the exception of the foundation modules' examinations as per (1) must be taken for the first time within the first three programme semesters. ²Any examination for modules scheduled for the third and fourth semester must be taken within the first six programme semesters. ³Any examination for modules scheduled for the fifth to seventh semester must be taken within the first six programme semesters. ⁴If students have exceeded one of these deadlines for reasons for which they are responsible, any examination that has not been
taken on-time is regarded as having been taken for the first time and is awarded the grade "non-sufficient" (Fristfünf).

4. Organisational Matters

§ 10 Examination Committee (Prüfungskommission)

The number of additional members of the examination committee for the bachelor's programme in Mechatronics in accordance with § 20 (1) Sentence 3 APO is three.

5. Academic Degree, Concluding Provisions

§ 11 Academic Degree

After successful completion of the bachelor's examination, graduates are awarded the academic degree Bachelor of Engineering (abbrev. “B.Eng.”).

§ 12 Coming into Effect, Expiration

These study and examination regulations shall come into effect retroactively to 1 October 2019.


The current version of these study and examination regulations applies in connection with the APO of 28 January 2019 to all students in the bachelor’s programme Mechatronics.

Drawn up on the basis of the resolution of the Senate of the University of Applied Sciences Würzburg-Schweinfurt of 11 November 2019 and the approval of the President of the University of Applied Sciences Würzburg-Schweinfurt as of 19 November 2019.

Würzburg, 19 November 2019

Professor Dr. Robert Grebner
President

These study and examination regulations for the bachelor's programme in Mechatronics were set down on 19 November 2019 at the University of Applied Sciences Würzburg-Schweinfurt. This was announced on 19 November 2019 in a poster. The date of publication is 19 November 2019.
Abbreviations:

APO General Examination Regulations
AWPF General Elective Course
AWPM General Elective Module
BA Bachelor’s thesis
BayHSchG Bavarian Higher Education Act
BayHSchPG Bavarian Higher Education Personnel Act
BEEG Federal Parental Benefit Act
B.Eng. Bachelor of Engineering
BGBl Federal Law Gazette
bZv Particular conditions for admission (to an examination)
d German (as language of examination)
e English (as language of examination)
ECTS European Credit Transfer and Accumulation System
Ex Excursion
FHWS University of Applied Sciences Würzburg-Schweinfurt
FWPM Core Elective Module
GVBl Bavarian Law Gazette
HSST Department of Student Affairs
m.E./o.E. passed successfully/failed
mP Oral examination
MuSchG Maternity Protection Act
PflegeZG Family Caregiver Leave Act
P Internship
Pro Project
RaPO General Examination Regulations for Universities of Applied Sciences in Bavaria
S Seminar
SGB XI Social Security Code Volume 11
soP Other types of assessments; the actual type of assessment is laid down in the study plan and announced at the start of the semester by the responsible lecturers. Only one type of assessment per module is to be completed.
sP Written examination
SPO Study and examination regulations
SU Seminar-like lecture
SWS Credit hours
Tpf In accordance with § 22 (1) APO, attendance is mandatory. Attendance is documented by signing the attendance list. The module manager is responsible for the attendance list.
Ü Practical/Exercise course
V Lecture

Abbreviations for assessment types:

A Engineering project
B Presentation
C Multimedia presentation
D Documentation report
E Colloquium
F Written assignment / term paper
G Portfolio assignment
H Practical assignment
# Appendix

To the study and examination regulations for the English-taught bachelor’s programme Mechatronics at the University of Applied Sciences Würzburg-Schweinfurt, valid from 1 October 2019

This Appendix shall apply to all students who begin their studies in the English-taught bachelor’s programme Mechatronics on 1 October 2017 or later.

<table>
<thead>
<tr>
<th>No.</th>
<th>Exam number / Module ID</th>
<th>Module name</th>
<th>Semester</th>
<th>Credits</th>
<th>ECTS credits</th>
<th>Course Type</th>
<th>Condition</th>
<th>Type</th>
<th>Duration / Format</th>
<th>Language</th>
<th>b/z</th>
<th>Final grade</th>
<th>Factor</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CMP1</td>
<td>Computing 1</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>SU, P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>H</td>
<td>e</td>
<td>no</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>MA1</td>
<td>Engineering Mathematics 1</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>SU, U</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PHY</td>
<td>Physics</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>FEE</td>
<td>Fundamentals of Electrical Engineering</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>SU, U</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>FMD</td>
<td>Fundamentals of Mechanical Design</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>H</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>CMP2</td>
<td>Computing 2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>SU, P</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>CMP1</td>
<td>0.5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>MA2</td>
<td>Engineering Mathematics 2</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>SU, U</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>EC1</td>
<td>Electrical Engineering 1</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>SU, U</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>EM1</td>
<td>Engineering Mechanics 1 (Statics)</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TL</td>
<td>Foreign Language</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>yes</td>
<td>0.5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>MCS</td>
<td>Microcomputer Systems</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>NM</td>
<td>Numerical Mathematics</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>EE2</td>
<td>Electrical Engineering 2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>EMDM</td>
<td>Elements of Mechanical Design and Strength of Materials</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>EM2</td>
<td>Engineering Mechanics 2 (Dynamics)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>GE</td>
<td>General Elective</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>MT</td>
<td>Measuring Techniques</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>ACT</td>
<td>Actuators</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>SU, U</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>PLCSE</td>
<td>Logical Control and Software Engineering</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>SU, U</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>CS1</td>
<td>Control Systems 1</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>H</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>CS1</td>
<td>Control Systems 1</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>H</td>
<td>e</td>
<td>yes</td>
<td>0.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>ESE</td>
<td>Embedded Systems and Fieldbuses</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>STCS2</td>
<td>System Theory and Control Systems 2</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>SU</td>
<td>sP</td>
<td>90-120 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>DSMS</td>
<td>Design and Simulation of Mechatronic Systems</td>
<td>5</td>
<td>3</td>
<td>7</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>H</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>EE2</td>
<td>Core Elective 2</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>EE2</td>
<td>Core Elective 2</td>
<td>5</td>
<td>8</td>
<td>10</td>
<td>SU, U, P</td>
<td>sP</td>
<td>90-180 min</td>
<td>e</td>
<td>yes</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>PRC</td>
<td>Practice-Related Courses</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>SU, U, S</td>
<td>sop (m.-b.-o.-e.)</td>
<td>90-120 min</td>
<td>e</td>
<td>die*</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>INT</td>
<td>Internship</td>
<td>6</td>
<td>0</td>
<td>24</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>90-120 min</td>
<td>e</td>
<td>die*</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>GE</td>
<td>General Engineering Lab</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>90-120 min</td>
<td>e</td>
<td>die*</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>EP</td>
<td>Engineering Project</td>
<td>7</td>
<td>4</td>
<td>7</td>
<td>SU, U, P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>90-120 min</td>
<td>e</td>
<td>die*</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>BS</td>
<td>Bachelor's Seminar</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>P</td>
<td>sop (m.-b.-o.-e.)</td>
<td>90-120 min</td>
<td>e</td>
<td>die*</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total | 140 | 210 |

*Details are determined by the Faculty of Applied Natural Sciences and Humanities as selected by student