

Basic Internship Regulations for the Bachelor's Programme "Engineering Science" (GPrO-ESBS)

10 June 2020

The Executive Board of the Hamburg University of Technology (TUHH) approved the Basic Internship Regulations for the course “Engineering Science” leading to a “Bachelor of Science” degree as per section 108, paragraph 1 of the Hamburg Higher Education Act (HmbHG) on xx June 2020. The provisions were decided by the board of the Department of Multidisciplinary Engineering Science and Technology at the TUHH on 10 June 2020 on the basis of section 3, paragraph 4 of the Regulations on Schools of Study and Departments (Satzung der Studiendekanate und Studienbereiche), of 26 October 2016, in the version dated 22 April 2020.

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Section 1 Scope

- (1) These Basic Internship Regulations (GPro) are an implementing regulation for section 1, paragraph 1.3 of the Statute on Studies at the Hamburg University of Technology (TUHH). They apply to the course “Engineering Science”, which leads to a “Bachelor of Science”.

Section 2 Conditions of admission to the Bachelor’s course

- (1) A basic internship as per section 1, paragraph 1.3 of the Statute on Studies at the Hamburg University of Technology (TUHH) is a condition of admission to the Bachelor’s course “Engineering Science”.
- (2) The basic internship is generally completed before the student commences the Bachelor’s course. Evidence that the basic internship has been completed must have been submitted by the time the student registers for their Bachelor’s dissertation. The dissertation cannot be commenced without evidence that the basic internship has been completed.

Section 3 Purpose of the basic internship

- (1) The basic internship should provide initial insight into the engineering profession, as well as initial practical experience, which is necessary to fully understand and successfully participate in classes. The basic internship should provide initial insight into professional practice. The intern is supervised by a specialist supervisor and thus gains an insight into the structure and organisation

of a company, as well as an overview of the various workflow and operating procedures. The intern learns to describe, explain and reflect on phenomena in engineering.

- (2) The basic internship also provides the intern with an insight into the company as a social system. The intern is to understand the company as a social structure, and to get to know the relationship between managers and employees, so that they can correctly classify their future position and the scope of their potential contributions.
- (3) At the same time, the basic internship serves to provide career orientation. The prospective student can establish whether they have the necessary motivation for a technical career.

Section 4 Basic internship duration and procedure

- (1) The duration of the basic internship is ten weeks.
- (2) It is possible to complete the basic internship over the course of more than one time period, and/or at several companies. A single internship period should not be shorter than four weeks.
- (3) Excused days of absence (due to holidays, illness or for other reasons) are limited to a maximum of 10% of the internship period. If this threshold is exceeded, the absence has to be made up for subsequently. In this case, the intern is required to ask the internship provider for an extension of the contract, so that they can fully carry out the required time of the internship period in question.
- (4) Unexcused days of absence will not be counted towards the duration of the internship. These are all days on which the intern was absent from the company without a valid reason (e.g. holiday or illness). Unexcused days of absence must be made up for subsequently. Paragraph 3, sentence 3 applies here.

Section 5 Eligible activities

- (1) The selection of activities for the basic internship depends on the student's interest in one of the following areas: civil engineering, bioprocess engineering, energy and environmental engineering, process engineering, electrical engineering, computer science, mechanical engineering, mechatronics, or naval architecture.
- (2) Basic internship activities in the area of *civil engineering* include in particular:
 - a. Practical work on a construction site: manual work such as bricklaying, concreting, formwork, reinforcement or work in a workshop. Activities in an engineering firm's offices, sector-specific administration, or environmental engineering firms. Preferably, interns should complete the entire duration of the internship on a construction site, but the mandatory minimum is five weeks on a construction site (construction site internship).
 - b. The intern is free to choose the internship activities. However, they should be engaged in a variety of activities (dealing with different construction materials, processes, techniques, etc.) The basic internship should therefore be completed in different areas of a civil or environmental engineering firm, such as building construction, foundation engineering, road construction, environmental economics and water management, etc.
- (3) Basic internship activities in the areas of *bioprocess engineering, process engineering, and energy and environmental engineering* include in particular:
 - a. Basic work in a training workshop (acquisition of basic knowledge in the manual processing of workpieces)
 - b. Work on machine tools, e.g. turning, planing, milling, drilling
 - c. Work in one or more of the following areas: Welding, soldering, forging, casting
 - d. Assembly, testing and quality control, maintenance and repairs on apparatus, devices and machines used in process engineering in a production or other workshop.
 - e. Work in the company laboratory or in the technical drawing office.

A total of at least three of the activities as per section 5, paragraph 3, letters a to e must be evidenced. Interns must complete at least two weeks in any one activity area.

- (4) Basic internship activities in the areas of *electrical engineering* and *computer science* include in particular:
- a. Fundamentals of electrical engineering (e.g. soldering, insulation, wiring, measuring...)
 - b. Production and testing of electrotechnical materials, components and assemblies
 - c. Fundamentals of metalwork (e.g. filing, drilling, thread cutting...)
 - d. Work on machine tools (e.g. turning, milling, laser cutting)
 - e. Fundamentals of programming (e.g. setting up a development environment, using basic language elements (loops, functions...))
 - f. Programming embedded systems (e.g. microcontrollers, PLC...)
 - g. Working on research and development projects
 - h. Project planning, calculations, simulation or construction
 - i. Developing complex software applications
 - j. Implementation of operational processes and production management
 - k. Marketing, sales, operational organisation, management and training
 - l. Quality management and control
 - m. Operating, maintenance, servicing and repairs
 - n. Dismantling, recycling and disposal

One half of the basic internship shall be dedicated to learning basic skills and processes, and should encompass as many of the activities as per section 5, paragraph 4, letters a to f, as possible. The intern should complete at least one week in each of at least three of the activity areas. This part is to be completed in a training workshop or under appropriate specialist guidance. The other half of the basic internship shall comprise practical experience in operational processes and engineering-related activities. In this second half, the areas of activity as per section 5 paragraph 4, letters g to n, shall be used as a guideline in order to gain the most comprehensive insight possible.

- (5) Basic internship activities in the areas of *mechanical engineering*, *mechatronics* and *naval architecture* include in particular:
- a. Basic internship 1: Machining processes (1-4 weeks)

Filing, chiselling, sawing, threading by hand, turning, planing, milling, drilling, countersinking, reaming, broaching, grinding, honing, lapping.
 - b. Basic internship 2: Assembly and testing (1-4 weeks)

Pre- and final assembly in the individual and series production of machines, vehicles, apparatus and equipment in mechanical engineering, or ships and ship parts in naval architecture; PCB assembly, measuring with mechanical, electrical, pneumatic and optical measuring methods, gauges, surface measuring technology, special measuring methods in mass production, familiarisation with production-related tolerance sizes and the relationship between accuracy and costs.
 - c. Basic internship 3: Primary shaping and forming (1-4 weeks)

Drafting and building a model, assembly of box components and model core, mould construction, hand moulding with models and templates, familiarisation with wet and dry casting, work in the core making facility, machine moulding and in casting (sand casting, gravity die casting, pressure casting, centrifugal casting, mould masks and investment casting), sintering, powder metallurgy and plastic injection moulding, open-die and closed-

die forging, cold forming/impact extrusion, rolling, deep drawing, spinning, punching, fine blanking, bending, straightening, riveting.

d. Basic internship 4: Joining and cutting processes (1-4 weeks)

Autogenous, arc and resistance welding, gas cutting, special welding and cutting processes, soldering, punching, bonding (welding courses can also be recognised).

e. Basic internship 5a: On-board internship (1-5 weeks, *only for naval architecture*)

On-board internship/seafaring time on ships serving commercial, humanitarian, research or public purposes; servicing, maintenance and repair work on machinery, equipment, and the ship's hull; participating in the watchkeeping activities of technical and nautical personnel; measuring operating parameters and operating conditions.

f. GP5b: Electrical engineering and computer science (1-4 weeks, *only for mechatronics*)

Creating basic electrical circuits (alternating circuit, self-holding circuit, star-delta circuit, etc.), operation, programming and use of programmable logic controllers (simple logic circuits, μ controllers, etc.), implementation, testing and operation of equipment for measuring, control, process and production engineering.

A total of three of the activities as per section 5, paragraph 5, letters a to e, must be evidenced. Interns must complete at least one week in any one activity area. In total, no more than four weeks (or, in the case of section 5, paragraph 5, letter e, no more than five weeks) per activity area shall be counted towards the duration of the basic internship.

- (6) For students with a permanent disability or chronic illness, special arrangements can be made with regard to which activities can be recognised. The responsible internship office as per Section 12 should be consulted in this regard.

Section 6 Internship position

- (1) Finding and applying for a suitable internship is the intern's responsibility.
- (2) The responsible internship office as per Section 12 shall advise the applicant/student, but shall not arrange any internship positions.
- (3) Internship providers for the basic internship must meet the following requirements:
 - a. The internship provider should facilitate an internship that serves the purpose outlined under section 1 and enables the activities outlined under section 5.
 - b. It should be an industrial company.
 - c. It should be a training enterprise certified by the Chamber of Industry and Commerce. The intern must be supervised by a person tasked with managing training.
- (4) A maximum of four weeks of the basic internship can be completed at an intern's family company.

Section 7 Internship report

- (1) A report shall be written on the entire duration of the internship.
- (2) The report should outline the general principles and essential characteristics of the applied procedures, as well as the tasks completed by the intern themselves. It should be evident that the intern completed the tasks themselves.
- (3) The report should contain a week-by-week summary of the activities carried out, if possible, with sketches and photos for explanatory purposes, and should be about ten A4 pages long (1 A4 page per week).
- (4) The report is to be written in German or English.

- (5) The intern should not describe or include photographs of objects, special facilities or procedures that are confidential. Documents whose use requires special authorisation should not be attached to the report without such authorisation being granted.
- (6) The report must be signed by the internship provider.

Section 8 Internship certificate

- (1) In addition to the report, an internship certificate from the internship provider is to be presented in order to gain approval of the internship or internship part. This certificate must contain:
 - a. Information on the intern,
 - b. Location and duration of the internship or internship part,
 - c. Type of activity,
 - d. Number of days of absence (listing days off for illness and unexcused days of absence separately)
 - e. Agreed leave days.
- (2) If possible, the certificate should also include the success of the activity and an evaluation of the intern's report.
- (3) The internship certificate must be written in German or English. If it is not, a certified translation into German or English must be included when submitting the certificate for approval of the internship.

Section 9 Approval of the internship

- (1) The basic internship shall be approved by the responsible internship office as per Section 12
- (2) For the approval, the student must submit the internship report as per Section 7 of these regulations, the original internship certificate as per Section 8 (if the internship certificate is not in German or English, it must be accompanied by a certified translation into German or English), and, potentially, a tabular overview of the completed internship part with a list of training parts to be approved, as well as a certificate from the internship office regarding training parts that have already been approved.
- (3) The internship office shall decide on the basis of the documents submitted whether and to what extent the internship corresponds to the provisions of these regulations, and shall approve the completed internship on the basis of this decision.
- (4) If the internship is approved, the intern will be issued with a certificate recognising the internship or internship part.

Section 10 Internships abroad

- (1) Internships completed abroad will be approved if they correspond to the provisions outlined in these regulations. The responsible internship office as per Section 12 shall reach a detailed decision on this.

Section 11 Recognition and approval of internship activities performed otherwise

- (1) Internships in the same subject area that have already been approved by another university or German technical college (Fachhochschule) will be recognised by the internship office in full if the intern presents the certificate of approval from the previous university. If there is no certificate of approval, the internship office will recognise the internship in full if the content of the internship can be demonstrated.

- (2) Completed, relevant professional training and practical professional activities can also be recognised as part of the basic internship depending on their nature and content, up to the total duration of ten weeks. Corresponding certificates and, potentially, the completed training plan are required for this.
- (3) Training periods from professional training that was not completed can be approved if the training periods can be evidenced by the training company, and there are corresponding reports about this training time. The internship office shall decide the extent to which these training periods from incomplete professional training can be approved depending on the evidence and reports provided.
- (4) In the event that an individual has completed engineering studies at a German technical college (Fachhochschule), the practical semester shall be approved as a ten-week internship, where such a semester was part of the course, and where its content corresponded to that outlined in Section 5 paragraphs 1 and 2.
- (5) Service periods working for the German Army or the alternative civil service (Zivildienst) can be approved for half of the internship period where evidence of the content outlined in Section 5 can be provided.
- (6) The following can generally not be approved as part of a basic internship:
 - a. School work experience (including that completed while attending a vocational school or technical high school (Berufsbildende Schule or Technisches Gymnasium),
 - b. Community college (Volkshochschule) courses.
- (7) For the recognition and approval of internship activities performed otherwise, Section 9 paragraph (4) applies.

Section 12 Internship office

- (1) The following internship offices are responsible for recognising the activities described in section 5, paragraphs 2-5:

Activity area	Internship office
Section 5, paragraph 2 Civil engineering	Civil and environmental engineering (School of Civil Engineering)
Section 5, paragraph 3 Bioprocess engineering, process engineering, and energy and environmental engineering	Bioprocess engineering, process engineering, and energy and environmental engineering (School of Process and Chemical Engineering)
Section 5, paragraph 4 Electrical engineering and computer science	Electrical engineering and computer science (School of Electrical Engineering, Computer Science and Mathematics)
Section 5, paragraph 5 Mechanical engineering	Mechanical engineering (School of Mechanical Engineering)
Section 5, paragraph 5 Mechatronics	Mechatronics (School of Mechanical Engineering)
Section 5, paragraph 5 Naval architecture	Naval architecture (School of Mechanical Engineering)

- (2) The internship office shall provide information in response to questions that relate to internships, and is responsible for approving the basic internship. The name and contact details of the corresponding contact person will be provided on the TUHH's website.

Section 13 Effective date

- (1) These Basic Internship Regulations come into effect on the day following their publication.

- (2) These regulations shall apply for the first time for applicants with approval for winter semester 2020/21 or students who commence their studies in winter semester 2020/21.

Hamburg, 10 June 2020

Hamburg University of Technology (TUHH)