

General Industrial Internship Regulations
for a Bachelor of Science (B.Sc.) in
COMPUTER ENGINEERING
COMPUTER SCIENCE AND COMMUNICATIONS ENGINEERING
CONTROL AND INFORMATION SYSTEMS
ELECTRICAL AND ELECTRONIC ENGINEERING
MATERIAL TECHNOLOGY
MECHANICAL ENGINEERING
and a Master of Science (M.Sc.) in
COMPUTER ENGINEERING
COMPUTER SCIENCE AND COMMUNICATIONS ENGINEERING
CONTROL AND INFORMATION SYSTEMS
ELECTRICAL AND ELECTRONIC ENGINEERING
MECHANICAL ENGINEERING
within the scope of the internationally oriented academic programme
INTERNATIONAL STUDIES IN ENGINEERING (ISE)
at the University of Duisburg-Essen

23. February 2005

(Official Bulletin 2, 2005, p. 351)

Pursuant to § 2, para. 4, and § 94, para. 1, of the Law for Universities of North Rhine-Westfalia of 14 March 2000 (GV. NRW. p. 190), last modified by the Act of 16 December 2003 (GV. NRW, p. 772), the Faculty of Engineering Sciences (Faculty 5, Campus Duisburg) at the University of Duisburg-Essen hereby issues the following Internship Regulations:

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I. General Regulations

ISE.

§ 1
Purview

These Internship Regulations, based upon the Examination Regulations for the internationally oriented programme International Studies in Engineering (hereafter 'ISE') at the University of Duisburg-Essen (announced in the *Gazette* of the University of Duisburg-Essen 18, 1 August 2003), govern the practical professional activities (hereafter 'internship') for students in

§ 2
The Purpose of the Internship

(1) The internship in an industrial firm is conducive to the understanding of course work taken in ISE. As an important prerequisite for a successful academic career and in the practice of a subsequent profession, the internship is an important part of any ICE subject. In preparation for the academic programme a prospective student should become acquainted with various basic practical methods and industrial

processes. The internship, however, should only support the development of secondary craft skills and thus differs fundamentally from an ordinary vocational apprenticeship. Its primary function is to help students acquire some sense of the operational systems of an industrial firm, its organisation and, above all, its social structure.

(2) The internship should complement students' academic programmes and, in its practical relevance, deepen their acquired theoretical knowledge. Interns will have the opportunity to become acquainted with the various branches of an industrial firm and to apply the knowledge there that they have acquired in ISE. An additional important aspect lies in the development of an understanding of the sociological side of the business world. It is important for interns to become acquainted with the relationship between management and employees in order to understand these roles in their future professions.

The transitional function between the academy and the industrial world will begin to develop in the first weeks of the internship when the interns begin to recognise whether they possess the necessary motivation for a career in engineering. This element will become even more apparent as the internship continues and overall impressions develop, thus laying a foundation upon which subsequent career decisions can be based.

§ 3 **Scope and Time**

(1) As described in § 7 of the Examination Regulations, the Faculty of Engineering Sciences requires the students in ISE to undertake a fourteen week industrial internship for a B.Sc. and an additional six weeks for an M.Sc.

(2) The internship can be divided into several separate phases of at least two weeks. It is recommended, however, that these periods should be of the largest longest possible duration.

§ 4 **Optional Industrial Internships**

The number of weeks stipulated for an internship is to be regarded as a minimum requirement. Students are strongly recommended to participate voluntarily in additional internships in firms relevant to their subjects of study.

§ 5 **Work Experience Training**

(1) The knowledge and operational methods developed during an internship, along with the experience of observing a commercial enterprise at first hand, and familiarisation with the social aspects of the world of work can only be gained in middle- and larger-sized companies that are recognised by the Chamber of Industry and Commerce as suitable for work experience training. Moreover, internships may be held in all companies that guarantee training within the framework of these guidelines. Craft enterprises within the maintenance and service sectors involved in small business manufacturing (as defined within the industry) are not regarded as suitable for internships. Neither are institutions of higher education (e.g., as a student assistant) or family businesses or companies.

(2) The appropriate Chamber of Industry and Commerce, as well as the professional counselling in the employment office, offers information on the firms best able to offer practical training. The University does not directly place students in internships; but the cooperation between the Examination Committee in ISE, the Internship Office and the Praktikumsbüro im Akademischen Zentrum für Studium und Beruf ('The Internship Office in the Academic Centre for Academics and Professions'; AKZENT), all of which publish a list of good training facilities, will prove helpful to those who are choosing a company for their internship.

(3) During their practical training students are, without exception, subject to the rules and regulations of the company conducting the training. It is expected that all interns will cooperate fully with their colleagues. The interns themselves, in their levels of interest and engagement, bear the primary responsibility for contributing to the success of their internship and must ensure that the requisite parts of the training plan are properly carried out.

(4) Supervision of the interns in the industrial firm shall be overseen by the director of training or an equivalent official (a mentor) within the company, who will ensure the execution of a valuable training experience that satisfies company standards and complies with the Internship Regulations as here defined. The mentor shall counsel the interns in technical matters relating to the internship.

§ 6

Legal and Social Standing of Interns

(1) Interns are responsible for the organisation of their practical training. For this reason the prospective interns should, whenever possible before applying for an internship and, at the very latest, before beginning one, acquaint themselves in detail with the rules governing the internship, the writing of the final report on these activities and all related matters by studying the Internship Regulations as set out in this document or, when necessary, by consulting the Internship Office (*Praktikantenamt*) of the University.

(2) The conditions of the internship are to be legally regulated by a training contract agreed by the company and the intern. This contract shall specify the rights and obligations of the intern and those of those within the company who are responsible for the training as well as the nature and duration of the internship.

(3) Matters of health insurance liability are regulated by the appropriate laws. The responsible insurance offices and professional co-operatives provide specific information. Interns are insured against accident during their work experience by the responsible insurance company (professional co-operative). According to the regulations in the Social Statute Book (*Sozialgesetzbuches*) and the Insurance Law for Employees (*Angestelltenversicherungs-gesetz*), an exemption from health insurance requirements may be granted to working students, because the term *Studium* (i.e., 'university education') is to be understood in fact as a kind of school education that is transmitted directly by a university and thus is primarily of a theoretical nature.

(4) The internship has the same status as tertiary education and can therefore be financially supported by *Bafög* (a state grant). The appropriate agencies will provide information on this point.

§ 7

Notebook and Certification

(1) Interns must keep a notebook (DIN-A4) in which they record observations on their own work and activities during their internships in the form of jottings, sketches, diagrams and the like. Preparation of this notebook is designed to train the interns to describe facts and circumstances concisely. The notes might well describe an industrial operation, tools, equipment or the like. They should comprise one or two pages per week (including sketches and drawings) and be prepared on a weekly basis.

Moreover, the daily character and duration of the duties performed should be noted. The reports can also be more extensive and describe activities that take more than one week to complete. Each page of the report must be authenticated (stamped and signed) by the company official responsible for internships.

(2) Each report must document the interns' thorough engagement with the activity described. Here it is necessary that they select their own experiences and observations and focus on them with the appropriate attention to detail. They must, however, avoid describing objects or special facilities subject to the maintenance of company secrets. As a general guideline, interns should refrain from a simply listing of the work performed or the summarising the contents of specialist literature. Reports of this nature can not be accepted for credit.

(3) A report should include the following features:

—title page that covers the main points in the internship, including important information such as the number and designation of the partial-internship, the name of the company and the period of the internship (the dates on which it began and ended, the duration in weeks);

—the weekly breakdown from the form 'Proof of Internship' ('*Ausbildungsnachweis*' (*Annexe A5*);

—the weekly work reports (each 1 or 2 pages in length) in the form of a notebook as described in (1) and (2) above.

(4) A certificate for the work done in the internship is to be made out for the intern by the training company. The certificate or a similar document must include the name of the company conducting the internship, the particular department involved, the place of business, information as to the identity of the mentor, the nature, duration and evaluation of the internship work undertaken. Work days missed because of illness or vacation are not calculated as time spent in completing the internship and are therefore also to be recorded on the Certificate.

§ 8
Validation Process

(1) The recognition of the internship is a matter for the Internship Office in the appropriate division in the Faculty of Engineering Sciences of the University. For this recognition it is necessary to present the original versions of the duly drafted progress report (certified by the company) and proof of activities.

(2) Certificates and the notebook must be presented to the Internship Office in a timely manner, i.e., within six months of the conclusion of the respective partial-internship. Exceptions to this regulation are those credits achieved before the beginning of admission to the programme in ISE.

(3) The nature and duration of the individual periods of activity must be clear from the documentation. An affidavit is not equivalent to the proper certification of an internship.

(4) The Internship Office determines whether the practical activities satisfy the Internship Regulations and therefore whether they can be recognised. Internship training accompanied by inadequate reports, whether they be incomplete or incompetently drafted, will be recognised for only a part of the period of its duration.

§ 9
Recognition of Previous Credits

(1) Credits acquired before admission to the University, together with all the requisite documentation, will be presented to the Internship Office during the registration period or at the beginning of the period of academic study.

(2) In response to an application by the intern, the Internship Office in the appropriate division of the Faculty of Engineering Sciences of the University will determine the amount of time from a completed apprenticeship (Lehre) and the work experience in this area that may be credited towards an industrial internship. This determination will be made on the basis of submitted certification and notebooks and as measured by the requirements of these Internship Regulations. The authority for acceptance of credit rests upon the recognition tables (Anerkennungstabellen) in the Internship Office.

(3) Technical activities in the armed services or in alternative civilian service (e.g., maintenance work) can be accepted for credit (up to a maximum of six weeks) towards an internship in the B.Sc. programme when they satisfy the demands of the Internship Regulations (*Materi-
alhaltungsstufe 2* ('maintenance level 2') and

higher). Certification can be achieved by the presentation of documents ('ATN-Bescheinigung' ('General Certificate of Activities')), unsigned certificates from the company office, as well as internship reports completed according to these Regulations. The issue of appropriate certification and the compilation of internship reports are by means of a waiver permitted by the Ministry of Defence. In addition, technical courses in the military division 'Berufsförderungsdienstes' can also be recognised for credit. Information on this point can be sought at the appropriate local *Kreiswehersatzamt-Berufsförderungsdienst*.

(4) Practical education in technical academic high schools (Gymnasien) and technical schools, as well as education for technical assistants in mechanical engineering or electrical engineering, can be recognised for credit (for up to a maximum of six weeks) towards the basic industrial internship when the appropriate certification is presented and accepted

(5) The times to be substituted as described in (3) and (4) in military service and alternative civilian service schools can only be recognised in their complete extent for a period of up to eight weeks.

§ 10
Holidays, Illness and Authorised Absence

Days missed due to holidays, illness, or other authorised absences shall not be counted in calculating the duration of the internship and must in all cases be compensated for.

§ 11
Special Regulations

Upon application by physically disabled students the Internship Office can arrange for special regulations.

§ 12
Internships Abroad

It is strongly recommended that internships should also be undertaken abroad. Documented time spent on such internships abroad shall be credited both as time required for internships and for time spent abroad (see § 8 ISE Examination Regulations). Internships abroad are subject to the requirements defined in these Internship Regulations and to the following additional stipulations: that the notebooks be written in German or English, and that the certification be accompanied by a notarised translation when its documents are written in any other language. While the internship abroad is expressly recommended, it must, of course, correspond in every respect to

the demands set out in these Internship Regulations.

§ 13
Transitional Regulations

These Internship Regulations apply to all students who have registered for a programme in ISE in the University of Duisburg-Essen. Before these Internship Regulations take effect, the credits for internships that satisfy the Internship Regulations for the integrated subject Electrical and Electronic Engineering and for the integrated internationally oriented subject Control and Information Systems at the Gerhard-Mercator-Universität Duisburg, as published in the *Official Bulletin*, No. 15/2001 and No. 6/2002, will be recognised. The same regulation applies to the internships that satisfy the Internship Regulations for the integrated subject Mechanical Engineering at the *Gesamthochschule Duisburg* ('Comprehensive University of Duisburg'), made public in the *Official Bulletin of the Comprehensive University of Duisburg*, No. 74, 18 December 1975 or the recommendations of Faculty 7 on the completion of practical training for students in the integrated subject Mechanical Engineering of 30 September 1996.

§ 14
Effective Date and Publication

These Internship Regulations shall come into effect on 01 April 2004. They shall be announced in the *Official Bulletin of the University of Duisburg-Essen*.

Drawn up in accordance with the resolution of Executive Committee of the Faculty for Engineering Science in Duisburg (5) of the University of Duisburg-Essen on 17 October 2003

Duisburg and Essen, 23 February 2005

The Founding Rector
The University of Duisburg-Essen
Prof. Dr. Lothar Zechlin

II. Additional Regulations and Annotations for a B.Sc. and an M.Sc. in Computer Engineering, Computer Science and Communications Engineering, Electrical and Electronic Engineering

II.1 Purpose of the Internship

The internship is designed to help participants to achieve insights, by means of their experiences, both intellectual and practical, into modern methods in computer science; this experience shall include the design, development

and deployment of computer systems or engagement with modern procedures and facilities for the development and manufacture of electronic components and information technology systems. Activities that include both the definition and development of projects as well as teamwork that promotes international cooperation are especially desirable.

III.2 Time Frame

The appropriate documentation of an internship as part of the B.Sc. programme completed prior to entering the University must be presented no later than when registering for the preparation of the B.Sc. thesis; similarly, the corresponding internship for the M.Sc. programme must be presented when registering for the preparation of the M.Sc. thesis.

II.3 Training Firms

In response to a separate application, parts of a B.Sc. level internship can be completed in a company specialising in handcrafts. In individual cases activities in the Computer and Media Centre can also receive credit in response to a separate application. Time spent as a student assistant in an An-Institute of the University that cooperates on research projects with the Faculty of Engineering Sciences can, in response to a specific application, be credited towards the internship requirement. An intern's activities in a company (as defined in § 5 (1)) as a working student in the amount of the time spent can also be credited.

II.4 Notebook and Certification

An intern is not required to present a notebook on activities undertaken as a practicing engineer before entering a programme in ISE (see the following § 6). The same applies to all credit-bearing activities that were completed not later than one year before the entry into one of the ISE programmes.

II.5 Recognition of Credits

(1) Internships undertaken abroad before admission to an ISE-programme—for example, in a subject leading to a B.Sc. in 'Computer Engineering', 'Electrical and Electronic Engineering' or 'Control and Information Systems'—may, in response to an application, be credited to the industry internship requirement for the B.Sc. The accompanying documentation must clearly indicate whether the internship activities abroad were carried out in a form that corresponds to the substance of these Internship Regulations. Here the

accompanying certification as well as a notebook or, in the event of no such notebook being kept, a list (in German or English) of specified activities must be included. When certification is written in another language, a notarised translation should also be attached to the application.

(2) Engineering Internships undertaken abroad after the completion of a B.Sc in 'Computer Engineering', 'Electrical and Electronic Engineering' or in 'Control and Information Systems' will be credited to an internship for a subject in the M.Sc. programme. Here also the accompanying certification to an application as well as a list (in German or English) of specified activities must be included. When certification is written in another language besides the two specified, then a notarised translation is also to be attached to the application.

III. Additional Regulations and Annotations for a B.Sc and an M.Sc. in Mechanical Engineering

The present Internship Regulations are based upon the 'Framework Regulations for an Internship in Mechanical Engineering and Methods Engineering in German Universities' (*Rahmenordnung für das Praktikum in den Studiengängen Maschinenbau und Verfahrenstechnik an deutschen Universitäten*), which were passed at the meeting of the Faculty of Mechanical Engineering and Methods Engineering on 06 July 2000 in Vienna. Internships that have already been recognised by an internship office included among the faculties and departments at the above meeting will be accepted in full without additional equivalency screening from internship offices of this Faculty or Department.

III.1 The Purpose of Internships

In preparation for academic work at the University prospective students should become acquainted, in its setup and its methods, with the practice of manufacturing work pieces, the manufacturing strategies and production techniques employed. Moreover, interns should also learn about quality control procedures and the *in situ* assembly of machines and instruments.

III.2 Time Frame

(1) The industrial internship is divided into an industrial basic internship and an industrial subject-related internship.

(2) The completed industrial basic internship is to be documented during the registration for the first continuous assessment examination in the B.Sc. programme; the completed industrial subject-related internship is to be documented during registration for the B.Sc. or the M.Sc. thesis.

(3) The industrial basic internship should be completed, where possible, in one time block. The individual activities of the industrial subject-related internship can be completed in random order. It is desirable that this internship is divided into periods spent in different firms, so long as the duration of the internship in a firm lasts at least two weeks.

(4) During registration formal control of a completed industrial internship shall not take place. Nevertheless, the prospective student is urged to complete the entire industrial basic internship before the beginning of classes in the first semester, since not following this recommendation will undoubtedly result in considerable delays during a student's studies. The semester breaks will normally be devoted to examinations, preparations for examinations and the intensive consolidation of knowledge gained in course work and will thus leave little time for completing an internship.

III.3 The Organisation of the Basic Internship

(1) The basic internship acts as an introduction to industrial manufacturing and to the transmission of essential basic knowledge. Interns, under the supervision of professionally qualified advisors, are to become acquainted with the manufacturability and workability of materials and to gain insight into production facilities and methods.

(2) Practical activities from the areas specified and explained in Annexes A2/1 and A3/1 of these Internship Regulations must be certified for the basic internship:

Annexe No.	Subject
A2/1	B.Sc. in MECHANICAL ENGINEERING
A3/1	M.Sc. in MECHANICAL ENGINEERING

III.4 Organisation of the Subject-Related Internship

(1) The subject-related internship is designed to impart subject-related knowledge in technology as well as to introduce the company's organisational procedures. In order to fulfil this function, it is advisable that the intern complete the subject-related internship during the semester breaks in the subject-related part of the programme. This procedure will in this way increase and combine the already acquired practical experience and the theoretical knowledge acquired during the academic programme at the University.

(2) Practical activities from the areas specified and discussed in the Annexes A2/2 and A3/2 of these Internship Regulations must be certified for the subject-related internship depending on the subject studied.

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Annexe No.	Subject
A2/2	B.Sc. in MECHANICAL ENGINEERING
A3/2	M.Sc. in MECHANICAL ENGINEERING

III.5 Recognition Procedure

(1) Internships that have already been recognised from an Internship Office mentioned in the meeting of the Faculty of Mechanical Engineering and Methods Engineering on 06 July 2000 in Vienna will be recognised by all the Internship Offices in these Faculties and their Departments.

(2) Recognised internships in other technical subjects besides mechanical engineering in German and foreign universities and institutions of higher learning will be given credit as long as they satisfactorily correspond to the requirements of these Regulations. Relevant documentation, such as the recognition of internship activities, company certification, information about the internship regulations on which this recognition is based and internship reports, is necessary for this process.

III.6 Employment History

Primarily job-related functions that a company has not expressly certified as 'internship activities' but which nevertheless promote education in the sense aimed at in these Regulations shall be credited for a maximum of four weeks as long as they were completed in the areas

here defined and in an appropriate company. Necessary requirements are the appropriate work attestation and the internship reports as defined in these Regulations but without certification from the company.

IV. Additional Regulations and Annotations for a B.Sc and an M.Sc. in Material Technology

I.V.1 Purpose of the internship:

In the B.Sc. in Material Technology, as in other subjects in the engineering sciences, the internship in a company is a component of the academic programme. The internship is designed to give the students hands-on experience in their chosen fields, an initial orientation for their later profession and an understanding of the social conditions of an industrial company. Acquaintance with the processes of materials engineering can serve to broaden understanding and to enrich the theoretical course material studied at the University.

I.V.2 Time Frame

(1) The internship is divided into a basic internship of at least four and no more than eight weeks, and a subject-related internship of at least six weeks. The basic internship and the subject-related internship amount to a total of fourteen weeks.

(2) Proof of the completed basic internship should be established by no later than the end of the second year (fourth semester). The basic internship can also be completed before admission to the programme. The appropriate technical training in an industrial company in the public area or in the military will be recognised.

IV.3 Structure of the Basic and Subject-Related Internships

(1) The basic internship is designed to introduce the intern to industrial work techniques and elementary knowledge of the processing of metallic and non-metallic materials. Work activities from the following areas are to be included:

- manual work techniques with materials (see Annexe A 4/1)
- mechanical work techniques with materials (see Annexe A 4/2)
- Bonding techniques with materials (see Annexe A 4/3)
- Heat- or surface treatment of materials (see

Annexe A 4/4)

- Quality assurance/materials testing (see Annexe A 4/5)

Two of the above mentioned areas are to be covered in the basic internship.

(2) The subject-related internship is designed to develop knowledge of the processing and operation of materials techniques during the manufacture and treatment of metallic and non-metallic materials and products. Work activities from the following areas are to be included:

- Metal production in pyrometallurgy, hydro-metallurgy and blast-furnace technology
- Melting metallurgy and casting methods
- Warm-metal forming and cold-metal forming
- Systems engineering of the above mentioned areas
- Production planning and control
- Product development and product management. At least three of the above named areas should be covered in the subject-related internship.

I.V.4 Recognition Procedure

In order to achieve recognition, the proof of the completed activities in the basic and the subject-related internships as defined in § 7 of these Regulations will be submitted to the student advisor for the B.Sc. in Applied Material Technology, who will then decide whether or not the completed activities will be recognised.

I.V.5 Employment History

Employment-related functions that a company has not expressly certified as 'internship activities' but which nevertheless promote education in the sense identified in these Regulations shall be credited as long as they were completed in the areas here defined and with an appropriate company. Necessary requirements are the appropriate work attestation and the internship reports as defined in these Regulations but without certification from the company.

Annexe A1

Areas of Activity in the Industrial Internship for a B.Sc. and an M.Sc. in Computer Engineering, Computer Science and Communications Engineering, Electrical and Electronic Engineering

Table 1: Areas of activity in an industrial internship

<p>1. Manual and mechanical basic activities for the handling of metals and synthetics</p> <p>(e.g., filing, sawing, chiselling, bending, marking, measuring, drilling, thread cutting, lathing, milling, planing, grinding)</p>
<p>2. joining techniques (e.g., soft- and hard soldering, welding, riveting, glueing, stapling, wrappen)</p>
<p>3. Manufacture of electronic components, parts and groups in electrical and electronic engineering</p> <p>(This includes, e.g., the production of circuit boards, the mounting and soldering of circuit boards and the construction of resilient soldered joints.)</p>
<p>4. Assembly, installation, inspection, maintenance and repair of equipment and hardware used in electrical engineering and communications engineering</p> <p>(including, among other things, measurement and control devices, video terminals, micro-computers and electronic devices.)</p>
<p>5. Programming</p> <p>(This includes, among other things, the implementation of simple, independent functions, such as device drivers, format converters, input/output functions, static and dynamic memory.)</p>
<p>6. Employment of user programmes</p> <p>(Includes the use of programmes for calculation of tables, data management and data banks, input and handling of technical drawings, connecting diagrams, texts and graphics, the development of multimedia presentations, application of net based communication technologies, and others)</p>
<p>7. Computation, project planning, construction, computer based technologies, operations from the practical and applied information sciences</p>

8. Assembly, installation, inspection, maintenance, start-up and repair of systems in the area of computer science, electrical and electronic engineering and control and information systems

9. Work in research, experimental and development laboratories and test bays
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10. Design, implementation and testing of software
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It is strongly recommended that the activities undertaken in the internships be tailored to the subject matter of the students' programmes and their special orientation, in order to ensure that the professional function of the internships is maximised.

In this context it is not necessary to complete a minimum number of the activities listed in the ten parts of the table. Similarly, there is no requirement that within any of the ten areas all of the examples enclosed in brackets—or that only those listed—be completed. The ten areas are only an orientation for the choice of activities that constitute the focus in any ISE programme at the University. With reference to the areas in the table only two restrictions are binding:

Of the required fourteen week minimum duration for the internship for the B.Sc. programme not more than five weeks can be spent completing the areas of activities listed in 1 to 3.

Of the required six week minimum duration for the internship for the M.Sc. programme none of the areas from 1 to 3 can be counted.

Annexe A2

A2/1 Structure of the Basic Internship for a B.Sc. in Mechanical Engineering

(1) For the basic internship lasting a minimum of six weeks, activities lasting between one to four weeks from at least three of the following areas must be certified (constituting a total period of six weeks):

- GP1: Metal-Cutting Manufacturing Systems
- GP2: Transformative Manufacturing Systems

- GP3: Primary Forming Manufacturing Systems

- GP4: Bonding and Separation Systems

(2) The following list contains model activities as content for the individual training areas GP1–GP4. Interns should become acquainted with several of these:

– GP1: Metal-cutting manufacturing processes: filing, chiselling, sawing, thread cutting by hand, lathing, planing, milling, drilling, counter-boring, reaming, bevelling, honing, lapping.

– GP2: Transformative manufacturing processes: free-form and drop forging, cold forming/extrusion, rolling, deep drawing, pressing, stamping, fine blanking, folding, trueing, riveting.

– GP3: Primary forming manufacturing processes: modelling, mould design and construction, wet- and dry casting, casting (sand casting, die casting gravity, centrifugal casting, precision casting), sintering, powder metallurgy and plastics processing (extrusion, injection moulding, blow moulding).

– GP4: Joining and separation processes: autogenous-, arc- and resistance welding, flame cutting, special processes of welding and separation, soldering, glueing, plastic welding. Basic courses in gas fusion welding and arc welding from the "Deutschen Verbandes für Schweißtechnik e.V." ('the German Federation of Welding Technology') will be recognised.

A2/2 Structure of the Subject-Related Internship for a B.Sc. in Mechanical Engineering

(1) The subject-related internship is of at least eight weeks' duration and must be completed during the academic programme at the University.

(2) The subject-related internship can be individually designed to include the training segments FP1 to FP10 listed below. At least three partial internships, however, must be certified from the areas FP1 to FP10, where at least **one** part from the Industrial Methods part (FP1 to FP5) and at least **one** internship from the Engineering Methods part (FP7 to FP 10) must be completed.

(3) It is also possible to complete the entire eight-week subject-related internship as an interdisciplinary project internship (FP10).

(4) The subject-related internship can be completed with a company abroad; the required period of three months spent abroad as defined in

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§ 8 of the Examination Regulations can thus be covered in part by time spent in the internship.

Industrial Methods	FP1	Surface Engineering, Heat Treatment	1-4 Weeks
	FP2	Tool Making, Jig Making	1-4 Weeks
	FP3	Maintenance, Service, Repair	1-4 Weeks
	FP4	Measuring, Testing, Quality Control	1-4 Weeks
	FP5	Manufacturing, Installation	1-4 Weeks
Engineering Methods	FP6	Research, Development, Construction, Experimentation	1-4 Weeks
	FP7	Production Planning and Control	1-4 Weeks
	FP8	Product Planning und Product Management	1-4 Weeks
	FP9	Subject-Related Internships in Cooperation with the Internship Office	1-4 Weeks
	FP10	Interdisciplinary Project Internship	4-6 Weeks

(5) The following groups contain model activities of the individual areas FP1 – FP10 with which the intern should become acquainted:

-FP1: Surface Engineering, Hot Treatment:

Surface coating: painting, galvanising, enamelling, fluidised-bed coating (powder sintering) etc., including preparation of these processes. Hot treatment: normalising, soft annealing, diffusion annealing, hardening and tempering of work pieces and tools, carburisation and nitriding.

- FP2: Tool Making, Fixture Construction:

Manufacturing of tools, fixtures, clamping force, measuring tools and templates, construction of models

- FP3: Maintenance, Servicing, Repair:

Maintenance and servicing of equipment and facilities and their repair

- FP4: Measuring, Testing, Quality Control:

Measuring with tactile and non-contact measuring procedures; use of measuring devices, surface measurement techniques; acquaintance with methods of quality assurance and the relation between manufacturing-related tolerance sizes and the cost of quality; quality control of products and manufacturing processes.

- FP5: Manufacturing, Installation:

Manufacture and pre- and final installation in individual- and run production of machines, vehicles, devices and equipment.

- FP6: Research, Development, Construc-

tion, Experimentation:

Work in project groups, development- and construction departments, research teams, departments of experimentation.

- FP7: Production Planning and Control:

Work preparation, planning of operating cycles in the manufacturing, structuring of design- and operations organisation, equipment proposals/estimates, monitoring and control of equipment and processes (SPS, process/online computer, process control systems, control programming), logistics

- FP8: Product Planning and Product Management:

Planning and placing of products, marketing, procurement and sales, financial controlling

- FP9: Subject-Related Internships in Cooperation with the Internship Office: Subject-related internships not named in FP1 to FP8

- FP10: Interdisciplinary Project Internship:

One of the areas from FP1 to FP8 can be chosen for an interdisciplinary project internship and can be expanded to four to six weeks. Here the intern should become acquainted with engineering teamwork in an industrial company with clearly defined divisions of labour, and should be integrated into the team in its solution of specific engineering problems. Examples of such work are tasks relating to the development of products, processes, planning, procurement, and the set up and launching of large industrial plant equipment.

Note: The handling of simple organisational or business details is not a subject for an interdisciplinary project.

Annexe A3

A3/1 Structure of the Basic Internship for an M.Sc. in Mechanical Engineering

(1) A prerequisite to be certified at registration for an M.Sc. in Mechanical Engineering is the completion of the required basic and subject-oriented internships (Annexes A2/2 and A2/2) for a B.Sc. in Mechanical Engineering.

A3/2 Structure of the Subject-Oriented Internship for an M.Sc. in Mechanical Engineering

(1) A prerequisite to be certified at registration for an M.Sc. in Mechanical Engineering is the completion of the required basic and subject-oriented internships (Annexes A2/2 and A2/2) for a B.Sc. in Mechanical Engineering.

(2) The supplemental subject-related internship for an M.Sc. in Mechanical Engineering must be of at least six weeks' duration. Of this period three weeks must be completed before the beginning of the programme of study and three weeks during the programme.

(3) The subject-related internship can be individually tailored to the training modules FP1 to FP10 listed in the Annexes A1/2. At least two internships from the areas FP1 to FP10 must be certified, including one internship from the Industrial Methods section (FP1 to FP5) and one internship from the Engineering Methods section (FP7 to FP10).

(4) It is possible to complete the entire six weeks of a subject-oriented internship as an interdisciplinary internship project as defined in Annexe A1/2 (FP10).

Annexe A4

Areas of Activity for the industrial internship in a B.Sc. in Material Technology

A 4/1:

Manual work techniques in the handling of work materials, such as filing, sawing, chisel-

ing, bending, marking, measuring, drilling, thread cutting

A 4/2:

Mechanical work techniques in the handling of work materials, such as lathing, milling, planing, grinding, drilling, counterboring

A 4/3

Bonding techniques with work materials: auto-genous-, arc- and resistance welding, flame cutting, special techniques of welding and separation, soldering, glueing, plastics welding, stapling, wrapping. Basic courses in gas fusion welding and arc welding from the "Deutschen Verbandes für Schweißtechnik e.V." ('the German Federation of Welding Technology') will be recognised.

A 4/4: Hot- or Surface treatment of work materials: normalisation, soft- and coarse-grain glueing, diffusion annealing, solution annealing, patenting, salt-solution treatment, annealing, GKZ annealing, hot-dip galvanising, tinning, aluminising, galvanising, powder coating, case hardening, nitriding, boration, cadmium plating and similar processes

A 4/5: Testing Work Materials/Quality Assurance: tensile-, pressure-, annealing-, bending- and notched bar impact testing, dynamic testing, metallographic and radar electronic microscopic testing, US-testing, x-ray graphic and x-ray/radiological inspection, surface testing, statistical evaluation of test series, testing of measurement devices, test devices and instruments

Annexe A 5 : Form 'Training Certification'

ANNEX A5: Form "Internship record"

Internship record No _____ dated from _____ to _____ 20____		_____ Name of intern student	
_____ Internship training provider		_____ Department	
Day	Practical work fields covered by the internship	Individual hours	Total hours
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Remarks by the intern student		Remarks by the internship supervisor	
_____ Date	_____ Intern student	_____ Date	_____ Internship supervisor