Anlage 5

Double Degree Programme
between
Justus Liebig University Giessen, and its Faculty of Biology and Chemistry, Germany
and
The Graduate School of Science and Engineering, Kansai University, Japan

1. Aims

Based on the agreement of Justus Liebig University (JLU) and Kansai University (KU) both universities establish a double degree programme on Master's level in chemistry. The programme provides the opportunity for master students of chemistry at JLU and for master students of the Graduate School of Science and Engineering at KU to gain the Master's degree of both universities: the „Master of Science“ of JLU and the „Master of Engineering“ (or the "Master of Science" – for KU students only) of KU.

2. Master's programmes

The double degree programme is based on the following two Master's programmes:

The **JLU Master's programme in Chemistry** is taught by Faculty 08 - Biology and Chemistry at the JLU. Starting every semester, the 2 years long programme (i.e. 4 semesters) includes core modules in chemistry, as well as optional modules in the first year (lecture-based modules). The second year is entirely devoted to research work. Students choose 3 research-oriented modules. The Masters' programme will be completed by submitting the Master's thesis and defending its results in front of an examination committee.

On successful completion of the programme, both faculties jointly confer the award of „Master of Science“(M.Sc.). Students receive a Master's certificate and a Certificate of Examination including Master's classification[1] and Transcript of Records (titles of all modules passed, workload and grading, title of Master's thesis and grading).

The Masters' programme itself is structured in modules. Modules are units of lectures, practical work, seminars, tutorials etc. dedicated to a specified topic (e.g. electrochemistry). Each module is described in detail by its content, aims, workload, types of exams, responsible lecturer etc. and is listed in the "Module descriptions" attached to the Special Regulation for the Master's programme in chemistry.

In general, there are two different types of **modules**:

- **Lecture-based modules:** These modules typically include a lecture (running for 15 weeks = 1 semester) and a seminar or a theoretical/practical exercise run by tutors. Thus, these modules can typically be finished completely within 4-5 months. Marks will be given on the basis of either a written or oral exam at the end of the module. The subjects of the modules typically represent important fields in science and technology. During the first year, JLU

[1] The M.Sc. award is classified according to an overall grading. The overall grade is calculated by dividing the total weighted grade points (grade points for each module multiplied by the credit points allocated to the module) by the total number of credit points.

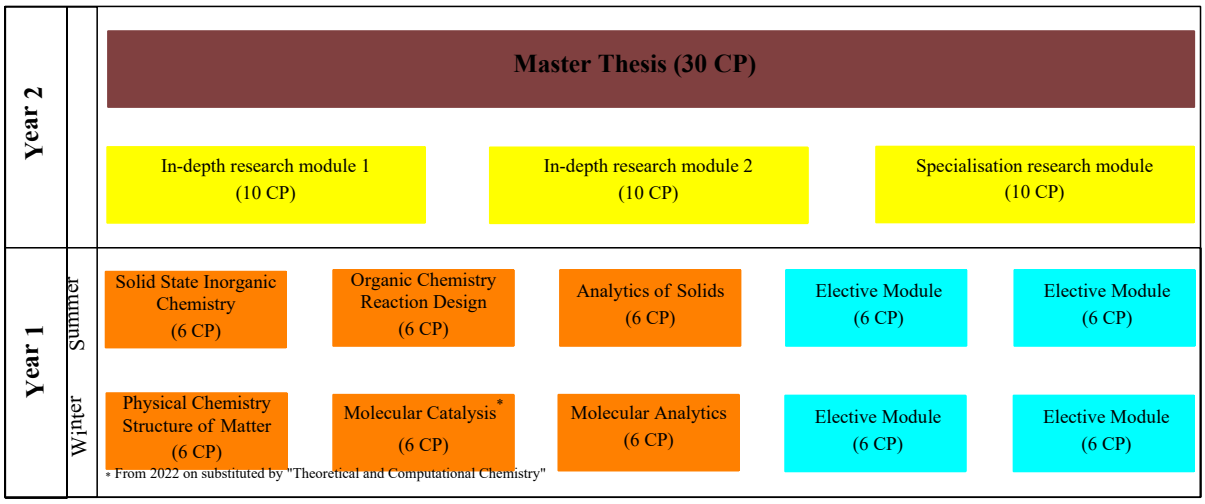
students take 6 of these advanced modules in chemistry. Additionally, they follow their own interests by choosing 4 optional lecture- and/or research-based modules (6 CP each).

- **Research modules:** These modules are exclusively research-based, and the modules are defined on an individual basis – depending on the research profile of the respective master student. The student can either take part in ongoing research or can be trained in a specific scientific method (e.g. a specific analytical method). At JLU students select three research modules during the second year: two in-depth research modules in chemistry oriented natural science (following their own interest) and one specialisation research module for preparing their Master thesis.

In accordance with the European Credit Transfer System (ECTS), the volume of learning activities (workload) required for achieving the Master's degree in Chemistry equals 120 ECTS Credit Points (CP), i.e. 30 CP per semester / 60 CP per year. 1 CP is equivalent to an average working time of 30 hours. This includes contact time at which students have to be present at lectures, seminars, tutorials, practical work etc. and time for preparation and post-processing. Finally, this also includes time for self-study and examinations.

Each first year lecture-based module comprises 6 CP corresponding to 180 hours working time. The second year research modules comprise 10 CP each (i.e. 300 h). Preparing and defending the Master's thesis is equivalent to 30 CP (i.e. 900 h / 22 weeks).

M.Sc. Chemistry Schedule:



The **KU Masters' programme** at the Graduate School of Science and Engineering

- **Lecture courses**: These courses typically run for 15 weeks. Marks will be given at the end of the course on the basis of either a written exam, a written report, or an oral exam. KU students typically takes 1 course from Group A, 2 courses from Group B and 8 courses from Group C. (2 credits each)
- **Project-based courses**: Some courses are given in the form of project-based learning. A research project is given for each student. Some introductory lectures are given and guidance will be given each week in response to the progress report of the students. Marks will be given at the end of the course on the basis of the performance. (2 credits each)

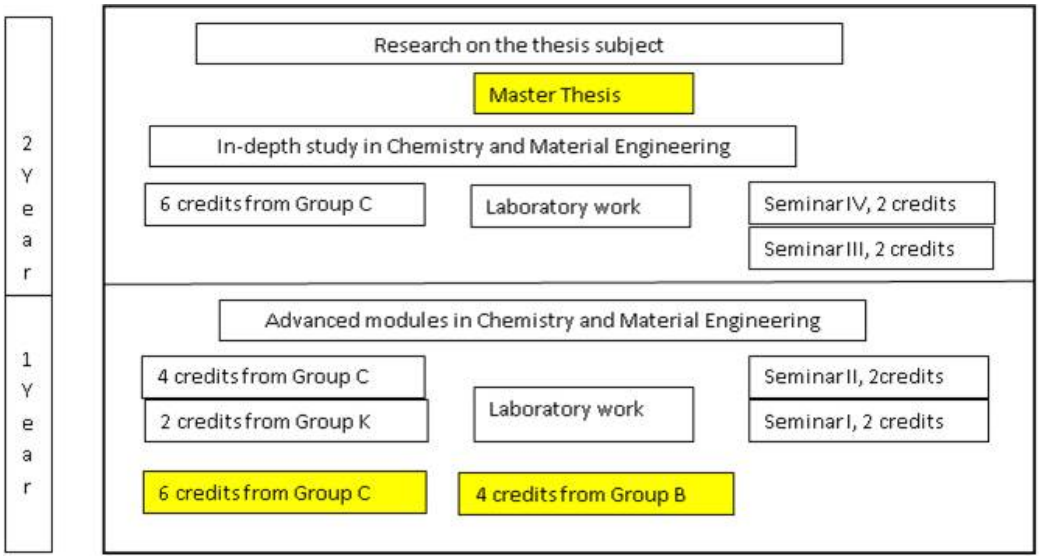
- **Seminar courses**: Seminar courses are exclusively research-based, and are defined on an individual basis. They are mainly aimed for the preparation of Master thesis. They include long-hour laboratory works but they are counted only 2 credits for each course.

Workload: 30 credits and the submission and defense of master thesis are required for achieving the Master's degree. Typically, 18 credits lecture courses, 4 credits project-based courses, and 8 credits Seminar courses are taken. The programme is designed to be completed in 2 years. As the below chart would illustrate, the courses from group A-K should be obtained mostly in the first year, whereas Master thesis and most of the in-depth study in their selected field as well as work at the laboratory should take place in the second year.

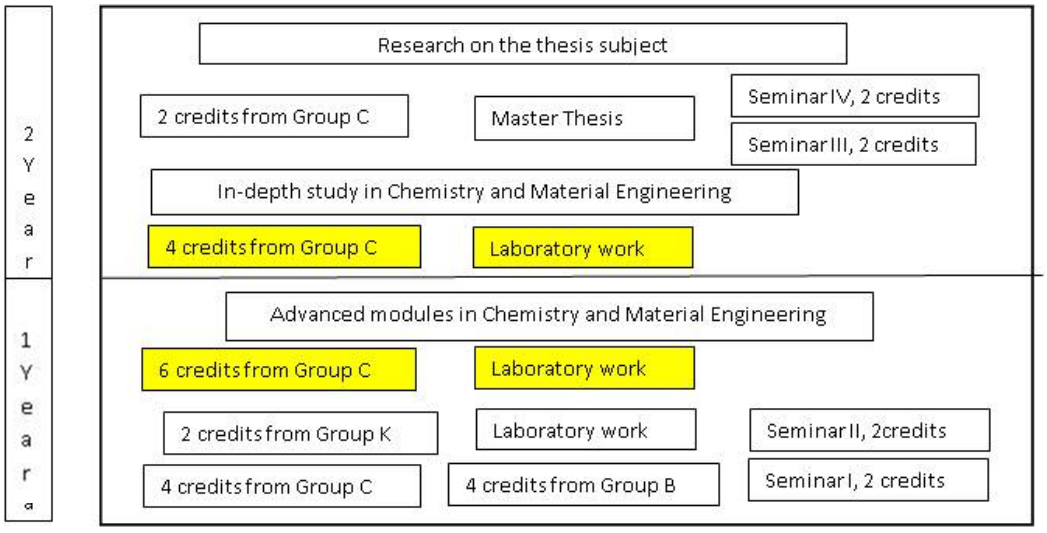
1 credit in lecture course is equivalent to the working time of 45 hours. This includes contact time at which students have to be present at lectures and time for preparation and post processing, and also it includes time for self-study and examinations.

Official workload for a Seminar course is the same as that for a lecture course. To account for the actual workload for Seminar courses, for DD students, KU will certificate the laboratory works. Marks will be given on the basis of written reports and/or oral presentations.

M. Eng Chemistry and Materials Engineering Schedule for JLU DD students:



M. Eng Chemistry and Materials Engineering Schedule for KU DD students:



Yellow boxes mean that they are to be replaced with the studies in JLU.

3. Double Degree Programme

Requirements for awarding a Master's degree of JLU and of KU in the framework of the double degree programme:

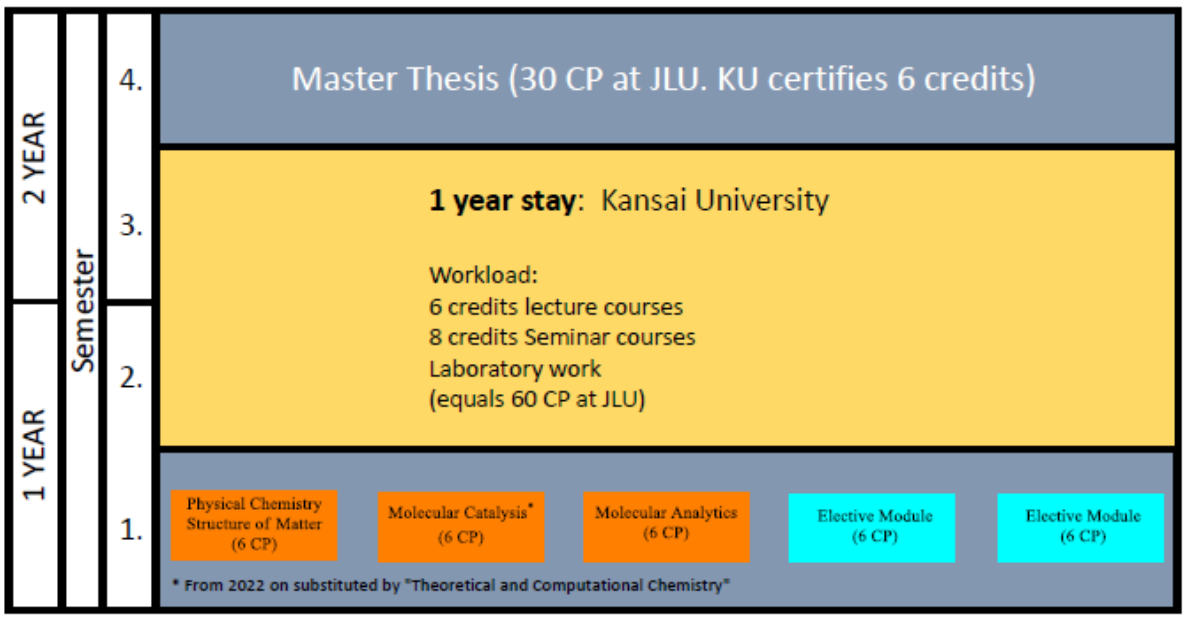
- Students have to complete a one year study stay at the partner university. During this time they have to pass all modules (i.e. the course work) defined in the working plan mutually agreed upon by the academic coordinators at JLU and KU. The working plan shall contain the typical workload per year at the partner university: i.e. at JLU 60 CP in total (lecture based and research modules), at KU 8 credits lecture course and 6 credits research. Therefore, each university offers a defined set of modules (i.e. lecture courses) taught in English. These modules (i.e. lecture courses) should be fully accepted by both universities. An updated list has to be provided by both universities regularly.
- Furthermore, the master thesis has to be written under joint supervision by professors from both universities and has to be defended in front of an examination committee.

Schedule for Students' Exchange:

JLU students of the Masters' programme in chemistry normally start their studies in October at JLU (semester 1: October - March). During the first semester, they have to pass 5 lecture-based modules (i.e. 30 CP in total). Afterwards, from March on, they spend a one-year study stay (2 semesters) at the KU Graduate School of Science and Engineering where they have to obtain 14 credits (equals 60 CP at JLU), typically, 6 credits by lecture courses and 8 credits by seminar courses. After coming back to the JLU, students complete their studies by preparing and defending their master thesis (30 CP at JLU. KU certifies 6 credits research).

(30CP at JLU. KU certifies 6 credits.)

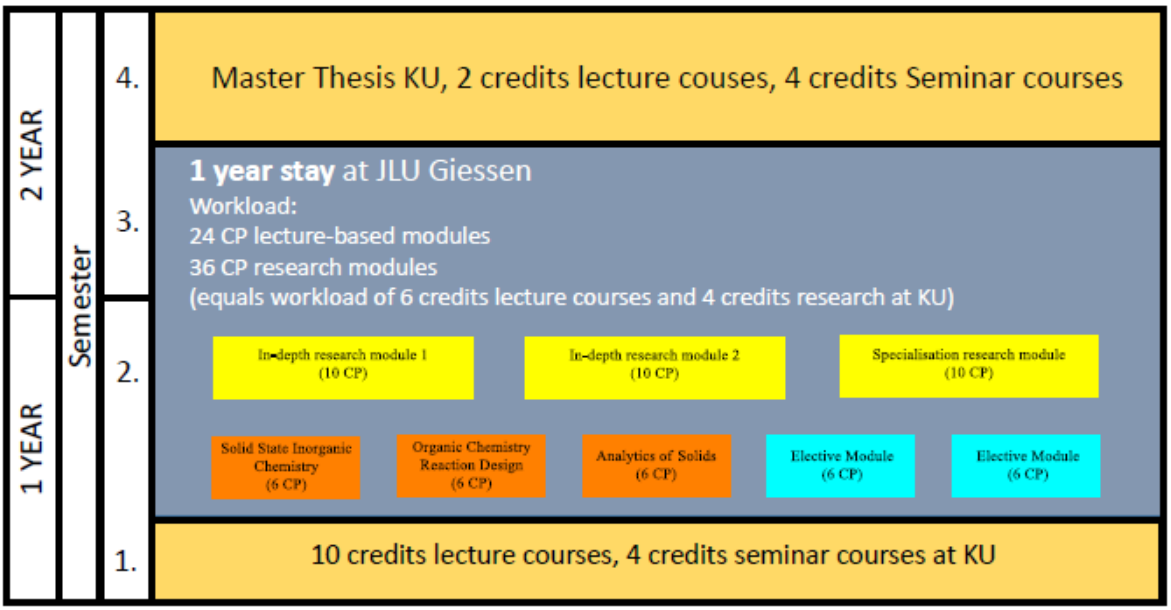
<u>Schedule for JLU students:</u>



Master's students of the Graduate School of Science and Engineering start their studies in April at KU. During their first semester (from April - September) they typically obtain 10 credits by lecture courses and 4 credits by Seminar courses. From October on, they spend a one-year

study stay (2 semesters) at the JLU where they have to obtain 60 CP in total: Students have to pass 5lecture-based modules (three core ones and two elective one) (6 CP each). Furthermore, depending on their research profile students choose 3 research modules (10 CP each), in consultation with their supervisor. Back at the KU, along with 2 credits lecture courses and 4 credits Seminar courses, students complete their studies by preparing and defending their master thesis.

Schedule for KU students:



In addition to the described schedule, KU students can also start in their first semester (April) at JLU and spend their first year at JLU before returning to KU. These students will follow the same study programme at JLU as those coming in their second semester.

4. Master thesis

After returning to their home university, students continue their research work and finalise their master thesis. Outcomes of the students' research work at the partner university shall be included in their Master thesis. These deliverables have to be specified as being gained at the partner university. The master thesis has to be written under the joint supervision of both universities and has to be submitted in English on schedule at the students' home university. One copy of the master thesis has to be provided for each supervisor at JLU and at KU. The outcomes of the master thesis have to be defended in English in front of an examination committee. The supervisor of the partner university has to be enabled to participate in the committee (in person or via internet).

5. Application and Entry Requirements

Admission procedures to the double degree programme are carried out by the home universities. At the same time, the host university reserves the right for making the final decision.

Both universities should nominate students of their Master's programmes (in addition KU may nominate students which are at the end of their Bachelors programme for starting at JLU in April).

As the entire study stay at the partner university will be conducted in English, knowledge of written and spoken English is required. Applicants must provide a certificate giving evidence of their proficiency in English. The following are accepted as evidence:

- 80 (iBT – internet based) in the TOEFL (Test of English as a Foreign Language),
- 6 points in the IELTS Academic Test (International English Language Testing System),
- a Bachelor's degree course completed in English or
- another approved English competency test (e.g. at JLU DAAD vd2 or UNIcert II European Level B2; at KU those who have (i) at least TOEFL score of 550 ~600 PBT and (ii) obtained a very good standing grade (A or above) from the English mediated courses offered at Kansai University in prior to their departure for their study abroad at JLU [For AY 2016-2017, Academic Writing Practice, Presentation Skills, and Academic Discussion & Debates].

Master students who are admitted to the JLU Master's programme in Chemistry or the KU Masters' programme at the Graduate School of Science and Engineering are eligible to apply for the double degree programme. In addition students in their last Bachelor semester (see §3 of the agreement) may apply. At the beginning of the semester prior to the exchange, applicants have to submit the following documents (in English) to the academic coordinator of their home university:

- Bachelor's Certificate (not applicable for KU students starting at JLU in April),
- Letter of motivation,
- Working plan accepted by a professor and the academic coordinator of their home university,
- Letter confirming supervision by a professor of the partner university,
- an approved English competency test (see above).

Additionally, JLU students must prove that they have participated at all first semester modules' and passed exams of four of them (24 CP) prior to the exchange.

Students may also be admitted to the programme on the basis of interviews guided by the academic coordinator of their home university.

Based on the requirements and procedures mentioned above, both universities should nominate students as candidates for the programme. By the partner universities' academic coordinators' approval (including confirmation of working plan and supervision) students are admitted to the double degree programme by their home university.

6. Language

Studying during the study stay at the partner university is carried out in English. The Master thesis has to be written and defended in English.

7. Workload Approval and Grading Scheme

It is agreed that mutual recognition of the period of studies at the partner university is guaranteed. The workload will be calculated on the basis of the guidelines of the participating universities. At the JLU, the basis for recognition is the Special Regulation for the programme in Chemistry leading to the Master of Science degree at Justus Liebig University Giessen:

https://www.uni-giessen.de/mug/7/findex36.html/7_36_08_2_C

The KU Masters' programme at the Graduate School of Science and Engineering consists of nine "Disciplines" which exactly correspond to the nine departments in the undergraduate course: 1. Mathematics, 2. Pure and Applied Physics, 3. Mechanical Engineering, 4. Electrical and Electronic Engineering, 5. Architecture, 6. Civil, Environmental and Applied System Engineering, 7. Chemical, Energy and Environmental Engineering, 8. Chemistry and Material Engineering, 9. Life Science and Biotechnology. They are grouped into three "Majors" which again correspond to the three faculties: I. Engineering Science (1, 2, 3, 4), II. Environmental and Urban Engineering (5, 6, 7), III. Chemistry, Materials and Bioengineering (8, 9).

There are two courses for the Master degree program. One is the standard course in which the lectures are given in Japanese language, and the other is the newly opened international course in which the lectures are given in English.

In the standard course, most of the students are those from the corresponding undergraduate course, though there are also students from other universities in Japan and foreign students who are qualified in Japanese language. Since the main part of the students is from Kansai University, the curriculum of this course is designed to extend from that of the undergraduate course. In the undergraduate course, the curriculum is organized to train the students to be engineers, teachers, public officers, and so on. It starts with the basic lectures in the first year, then higher level lectures in specialized fields follow in the second and in the third year. In the final year, the students belong in the laboratories and do their research under the supervision of the professors. The total number of 128 credits is necessary to finish the undergraduate course. The students coming to the Graduate School are expected to have the knowledge which is necessary to start their thesis research. The lectures in the Graduate School are given rather independently by each professor without much correlation among the lectures. Thus, the organization of the lectures in the master course is quite different from that in the undergraduate course.

Lectures in the standard course are grouped into three categories: Group A, Group B and Group C. Group A contains the lectures that are common to all the Disciplines, for example, "Engineering Ethics", "Intellectual Property", "Philosophy of Science and Technology", and so on. They offer general knowledge to the students to be highly educated engineers and scientists. Group B contains the basic lectures that are common to a group of some Disciplines. For example, for Chemistry, Materials and Bioengineering Major (Faculty), it contains "Safety Technology", "X-ray Diffraction", "Polymer Science", "Advanced Life Science", "Advanced Biotechnology", and so on. Group C contains the specialized lectures given by each professor.

In order to be granted a Master degree (in Engineering or in Science), it is necessary for the students to acquire 30 credits and to submit the thesis. Among the 30 credits, 2 credits must be acquired from the common subjects in Group A. It is also recommended to take some

classes from Group B. Besides these general subjects, the students need to take classes on their specialized subjects. They include compulsory four “Seminar” classes in which the students make preparations for the thesis work under the supervision by the professor. Students take one Seminar class in each semester. Each Seminar class is worth only 2 credits, but it actually reflects all the laboratory works by the students. Normally, students acquire about 24 credits in the first year. That is, even in the first year, students spend a significant amount of time in the laboratory, acquiring laboratory skills and learning how to organize research projects. In the second year, they focus on the thesis work. Many of them have chances to report on their research work in academic meetings.

The newly opened International course is organized for the foreign students who are not familiar with Japanese language. In this course, the lectures are given in English and the direction and guidance on the research are also given in English. The students are requested to submit a master thesis that is written in English. The number of lectures in this course is rather limited at this moment and it will get larger in a few years. The lectures in the International course are grouped into two categories: Group K and Group C. Group K contains the lectures that are common to all the students in this course. There are lectures for the foreign students to get familiar to Japan (Japan study), such as its history and culture of Japan, company management and business in Japan and so on. Group C contains some general lectures of the field specially prepared for this course and the specialized lectures by each professor.

As in the standard course, it is necessary to acquire 30 credits to obtain a Master degree of Kansai University. Four “Seminar” classes (8 credits) are compulsory also in this course. One has to acquire at least 2 credits (or 4 credits) from Group K.

This course is applied also to the students in the DD (double degree) program. In the case of the DD program, one may utilize the credit transfer system to cover the maximum of 10 credits. The 8 credits of Seminar classes and the credits from Group K are still compulsory. That leaves about 10 credits to be acquired from Group C.

It is strongly recommended for the students in the DD program to discuss in advance with the home supervisor and with the host supervisor on what subjects should be learned in Japan.

Workload Approval:

Gaining the Master’s degree of JLU and of KU in the framework of the double degree programme requires that students pass modules (i.e. course work) to the extent of a typical one-year workload at the partner university:

- at JLU 60 CP in total (lecture based and research modules),
- at KU 6 credits lecture courses, 8 credits Seminar courses.

Mutual recognition of study periods (modules/course work resp. CP/credits) is implemented on the basis of the following tables which contain a comparison of workload at JLU and KU.

Workload approval for JLU students:

	Approved as *(in italics)*	
	JLU	**KU**
1.Semester (JLU)	30 CP (5 x 6 CP modules)	*10 credits lectures*
2.+3.Semester (KU)	*24 CP (4 x 6 CP modules)*	6 credits lectures
	36 CP research modules	8 credits Seminar
4.Semester (JLU)	30 CP (Master thesis)	*Master thesis (6 credits research)*
Σ	**120 CP**	**16 credits lecture, 14 credits research**

Workload approval for KU students (the same workload holds true for KU students going to JLU in their first semester):

	Approved as *(in italics)*	
	KU	**JLU**
1.Semester (KU)	10 credits lectures, 4 credits Seminar + lab. work	*30 CP*
2.+3.Semester (JLU)	*6 credits lectures, 4 credits research*	24 CP (4 x 6 CP modules), 36 CP (6 CP project, 30 CP research modules)
4.Semester (KU)	2 credits lectures, 4 credits Seminar + Master thesis	*30 CP*
Σ	**18 credits lectures, 12 credits research**	**120 CP**

Comparative Grading Scheme:

All work performed within modules shall be graded in accordance with the grading scheme applicable at the universities in question.

Comparative table of JLU/KU grades:

JLU			**KU**		
Percentages for the evaluation	**Grades**	**Verbal grades**	**Percentages for the evaluation**	**Grades**	**Verbal grades**
≥ 97	15	very good with distinction	≥ 80	A	very good
≥ 92	14	very good			
≥ 87	13	very good			
≥ 82	12	Good			
≥ 77	11	Good			
≥ 73	10	Good	70 – 79	B	Good
≥ 68	9	satisfactory			
≥ 64	8	satisfactory	60 – 69	C	sufficient
≥ 59	7	satisfactory			
≥ 54	6	sufficient			
≥ 50	5	sufficient			
< 50	4-0	Fail	< 60	F	Fail

For approval of workload and grading, a summary table should be provided in English for each student by the corresponding university. The summary table should also contain the title of the modules, workload, percentage reached and the grades (Transcript of Records). In order to arrive at the overall grade, the module grades at JLU should be converted into KU grades and vice versa in accordance with the table presented above.

8. Master’s Certificate

Students who meet academic requirements (provided that no module is finally failed) in the framework of the double degree programme should be awarded two Master’s Certificates: the Master’s certificate of JLU „Master of Science“ and the Master’s certificate of KU „Master of Engineering“ (or “Master of Science” for KU students only). Both certificates must refer to the bilateral double degree programme. Students also receive a Certificate of Examination including Master’s classification and a Transcript of Records. Both universities provide Diploma Supplements.

9. Academic coordination

To ensure and facilitate the implementation of the double degree programme, each institution shall appoint an academic coordinator as contact person. The coordinators can be addressed by students, JLU and KU colleagues of the double degree programme. Besides admitting applicants, they are authorized persons for accepting students’ working plans and workload approval.