

Agreement on Graduate Student Exchange Program

Leading to a Double Master's Degree in Engineering

Between

Ryerson University

And

Karlsruhe University of Applied Sciences

1. Participating Departments

Ryerson University (RU)

Department: Electrical and Computer Engineering

Degree: Master of Engineering

Karlsruhe University of Applied Sciences (HsKA)

Department: Electrical Engineering

Degree: Master of Engineering

2. Project Information

- Project Start Date: September 2009
- Project End Date: September 2013

3. Characteristics of the Exchange Program

3.1 Student Exchanges

- a) Program Start Date: September 2009
- b) Program Duration: Typically 2 years (4 semesters), including Master's thesis project
- c) Academic Student Exchange Period: Two (2) semesters at RU and two (2) semesters at the HsKA
- d) Students have the choice to start either at the home or host institution for a consecutive two semesters
- e) Student exchanges are only acceptable at the beginning of the academic year at the host institution
- f) Number of exchange students: Five (5) students will be exchanged per year from each partner institution. Exchange student reciprocation should be achieved during a period of three (3) years, as agreed in the Memorandum of Understanding signed by all parties in February 2008.
- g) Tuition fees: Students participating in this program will be charged tuition fees by their home institution only.

3.2 Academic Details

a) Admission

- Admission to the Double Degree Program is undertaken at the home university. A list of the selected candidates at the home university will be provided to the host university for formal approval and admission into the program.
- For Ryerson students: Minimum requirements for admission at RU as the home institution is a bachelor's degree in an electrical engineering based program with overall grade at least "B"
- For HsKA students: Minimum requirements for admission at the HsKA as the home Institution is a bachelor's degree in an electrical engineering based program with at least 180 CP cf. ECTS, overall grade better than 2.5, and for admission at RU language certificate cf. TOEFL with at least 550 points or IELTS with 6.0 points or TOEIC with 750 points.

b) Work load

- For the degree at the HsKA: 90 CP cf. ECTS + master thesis project (including some credits at RU, see degree requirements)
- For the degree at RU: 8 courses + master thesis project (including some credits at the HsKA, see degree requirements)

c) Language of Instruction

- All modules / courses which are part of the double degree program are offered in English
- In addition, all modules at the HsKA are also offered in German. Each module will be offered each semester: in one semester part of the modules are offered in German, the other part in English. In the next semester, the instruction language of the modules changes.

d) Master's Thesis Project

- One Master's thesis project, which is accepted by both universities
- The documentation of the Master's thesis project has to be in English
- Students can choose the institution at which they will do their Master's thesis project
- Supervision is done by two professors: one from each institution
- Principal advisor is from the institution at which the project is carried out
- Duration of Master's thesis project is equivalent to 6 months full time work, i.e. 30 CP (ECTS)
- Start of Master's thesis project and part time work on it is possible at the beginning of the second year of studies

e) Academic calendar

Institution	Semesters (1)	Semester (2)
Ryerson	September – December (Fall)	January – April (Winter)
HsKA	October – January (Winter)	March – July (Spring)

f) Joint Program Committee

A joint program committee (JPC) will be established with three professors from each RU and HsKA. Two of them are co-chairs (program directors); one from RU, the other from HsKA. Responsibilities: Development of the program, examination rules, students advising etc.

g) Funding / Grants

Each Party will aim to acquire grants for their own students for the period abroad. HsKA will apply for a DAAD grant, RU will check funding from the OBW (Ontario-Baden-Württemberg) program.

4. Structure of studies for students from HsKA

4.1 Study program at HsKA:

- modules totalizing 42 CP cf. ECTS (excluding Master's thesis project) from the curriculum of the existing Master's program in Electrical Engineering at HsKA
- choice has to be approved by HsKA's program director

4.2 Study program at RU:

- a total of 6 courses by choice from the list given in Table 1, in each semester 3 courses
- choice has to be approved by RU's program director
- in addition to the 6 professional courses from Table 1, it is mandatory for the student to take the soft-skill course Art of Communication in Engineering and Science

Nr.	course-nr.	Name
1.	EE8102	Signal Detection Theory
2.	EE8104	Adaptive Signal Processing
3.	EE8111	Digital Signal Processing II
4.	EE8112	Digital Waveform Processing
5.	EE8204	Neural Networks
6.	EE8212	Digital Image Processing II
7.	EE8108	Multimedia Processing
8.	EE8121	Wireless Networks
9.	EE8207	High Performance Computer System Design
10.	EE8205	Embedded Computer Systems
11.	EE8213	Computer Network Security
12.	EE8216	Computer Networks
13.	EE8601	Directed Studies: Electrical Engineering
14.	EE8603	Selected Topics: Computer Engineering
15.	EE8604	Selected Topics: Electrical

		Engineering
16.	EE8215	Human Machine Interface
17.	EE8401	Computer Methods in Power Systems Analysis
18.	EE8403	Advanced Topics in Power Systems
19.	EE8405	Power System Stability and Control
20.	EE8408	Switched Mode Power Supply
21.	EE8412	Advanced AC Drives
22.	EE8413	Advanced Digital Control of Power Systems

Table 1: Courses at RU which can be taken by HsKA-students

- **Remarks on Table 1:** The courses at RU are given either in Fall or in Winter. A list of which courses are usually held in which semester will be supplied. One course consists of lectures in an amount of 3 hours/week plus assignments and self study. The work load for assignments and self study is about 3 times presence time. Thus one course has a work load of about 12 hours/week and is credited with 6 CP cf. ECTS.

5. Structure of studies for students from RU

5.1 Study program at HsKA:

- modules totalizing 42 CP from the list given in Table 2
- choice has to be approved by the HsKA's program director
- in addition to the modules chosen from Table 2, it is mandatory for the student to take the course "Deutsch als Fremdsprache" (German as a Foreign Language) of the IFS (Foreign Language Institute) at HsKA. The course will consist of a block course in September and of the regular follow-on course in the fall semester (4 lecture hours/week). At the beginning, the language prerequisites of the students are evaluated. Based on the result, the students will attend the course suited to their knowledge of the German language.

Nr	Module nr.	Title	CP	lecture hours/week
1	E1M110	Distributed Control Systems	8	6
2	E2M120	Project Work	8	
3	E2M170	RF Measurements	8	6
4	E1M161	Information Theory and Coding	4	4
5	E2M190	Medical Systems	4	4
6	E2M180	Signal Theory	6	4
7	E2M160	Communication Systems	4	4
8	E1M130	Optical Data Transmission	4	4
		Total	46	

Table 2: Modules at HsKA which can be taken by RU-students

5.2 Study program at RU:

- 6 courses from the master program in Electrical and Computer Engineering of RU
- choice has to be approved by RU's program director

6. Grade Conversion

- **Conversion of Canadian grades to German grades** for the German diploma supplement and transcript of records cf.

Canadian grade	Canadian numerical grade (best: 4, worst: 0)	German grade
A+	4.33	1
A	4	1.3
A-	3.67	1.7
B+	3.33	2.3
B	3.0	2.7
B-	2.67	3.0
F	0	4.7

Table 3: Conversion of Canadian grades into German grades

Note: In the Master's program at RU the grades C, D, E, and F, are considered as failure and are marked with F.

- **Conversion of German grades** for the Canadian diploma supplement and transcript of records: the modules from HsKA credited for the RU degree will be listed in the RU's transcript of records without grade, with the remark "accepted".

7. Degree Requirements for participating students

- **HsKA degree is obtained after:**
 1. successful completion of modules with a total amount of 42 CP from Table 2 at HsKA
 2. successful completion of 3 courses at RU (thus acquiring 18 CP from courses attended at RU)
 3. successful completion of the German language course at HsKA (RU students only)
 4. successful completion of the Master's thesis project
- **RU degree is obtained after:**
 1. successful completion of 2 modules from Table 2 at HsKA (credited for the workload at RU)
 2. successful completion of 6 courses from RU's master program Electrical and Computer Engineering
 3. successful completion of the soft-skill course at RU (HsKA students only)
 4. successful completion of the Master's thesis project

8. Terms of Student Exchange Activities

Student exchange activities will be governed by the terms specified in the Student Exchange Agreement signed between Ryerson University and Karlsruhe University of Applied Sciences. The Double Degree Project will be governed by the Memorandum of Understanding signed between Ryerson University and Karlsruhe University of Applied Sciences.

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