

Joint Curriculum

Master of Science in Chemical and Energy Engineering

Participating Institutions: OVGU (Magdeburg, Germany) and KNRTU-KAI (Kazan, Russia)

Duration of Study: 2 years

Place for Study: 1st, 2nd and 4th semesters – at KNRTU-KAI, 3rd semester – at OVGU Magdeburg

The following tabular gives an overview about the collaborative Master program. Details will be arranged and documented on operational level between responsible representatives of the participating faculties.

1st semester (winter)

Module	Credits of the Module, ECTS	Minimum Contact Hours	Minimum Total Student Workload Hours	Cert	University`s Teachers
Philosophical Problems of Engineering Knowledge	2	30	60	Exam	KNRTU
English Language / German Language*	3	56	90	Test	KNRTU
Economics and Production Management	2	33	60	Test	KNRTU
Mathematical Modelling /	2	28	60	Test	KNRTU

Computational Modelling*					
Modern Problems of Energy and Heat Engineering / Thermal Engines*	2	28	60	Test	KNRTU
Problems of Energy Resource Saving in Energy and Heat Engineering / Renewable Energies*	3	42	90	Exam	KNRTU
Research Work	6	90	180	Test	KNRTU
Pedagogical Practice	6	90	180	Test	KNRTU
Ecological Safety / Safety Aspects of Chemical Reactions*	2	20	60	Exam	KNRTU
Principles of Effective Process Control in Energy and Heat Engineering / Product Quality*	2	30	60	Test	KNRTU
Total	30	447	900		

* - Selective Modules

2nd semester (summer)

Module	Credits of the Module, ECTS	Minimum Contact Hours	Minimum Total Student Workload Hours	Cert	University`s Teachers
Research Work	5	75	150	Test	KNRTU
Chemistry	5	42	150	Exam	KNRTU or OVGU
Advanced Fluid Dynamics	5	56	150	Test	KNRTU or OVGU
Advanced Heat and Mass Transfer	5	56	150	Test	KNRTU or OVGU

Mechanical Process Engineering	5	56	150	Exam	KNRTU or OVGU
Chemical Reaction Engineering	5	56	150	Exam	KNRTU or OVGU
Total	30	341	900		

3rd semester (winter)

Module	Credits of the Module, ECTS	Minimum Contact Hours	Minimum Total Student Workload Hours	Cert	University`s Teachers
Research Practice and Research Work (Laboratory Work and Excursions)	10	90	300	Test	OVGU
Thermal Process Engineering	5	56	150	Exam	OVGU
Process System Engineering	5	42	150	Exam	OVGU
Combustion Engineering	5	42	150	Exam	OVGU
Plant Design	5	42	150	Exam	OVGU
Total	30	272	900		

4th semester (summer)

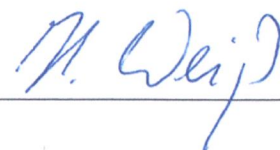
Module	Credits of the Module, ECTS	Minimum Contact Hours	Minimum Total Student Workload Hours	Cert	University`s Teachers
Research Practice (as a Part of Master Thesis)	27		810	Test	KNRTU and OVGU

Master Thesis Preparation and Defence (RCS)	3		90		KNRTU and OVGU
Total	30		900		

On behalf of OVGU Magdeburg



Prof. Jens Stracke
Rector

Prof. Helmut Weiß
Coordinator of the MSc Program

22. APR. 2014

On behalf of KNRTU-KAI



Prof. Albert Gilmutdinov
Rector

Prof. Victor Gureev
Coordinator of the MSc Program

Courses in the Collaborative Master Program

Chemical and Energy Engineering (CEE)

amendment of 08 March 2016 to the contract between
Kazan National Research Technical University A.N.Tupolev — KNRTU-KAI
and
Otto von Guericke University Magdeburg - OVGU
entered on 29.01.2015

1 Preamble

The following rules apply for the Collaborative Master Program Chemical and Energy Engineering

- Students should consider section 2 to plan their schedule.
- Administration will acknowledge courses according to section 3.

Subsections may reflect changes effectuated between different academic years.

2 Courses

2.1 Program 2014/2015 and 2015/2016 (2nd year of studies) at KNRTU-KAI and 2015/2016 at OVGU

1. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) *compulsory courses*

- Philosophical Problems of Engineering Knowledge (2CP RU)
- Economics and Production Management (2CP RU)
- Research Work 1 (6CP RU)
- Pedagogical Practice (5CP RU)

(b) *selected courses*

- Foreign Language – Technical Translation (2CP RU)
- Business Communication in Foreign Language (2CP RU)
- Mathematical Modeling (2CP RU)
- Modern Problems of Energy and Heat Engineering (2CP RU)
- Problems of Energy Resource Saving in Energy and Heat Engineering (3CP RU)

- vi. Ecological Safety (2CP RU)
- vii. Principles of Effective Process Control in Energy and Heat Engineering (2CP RU)

2. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) *compulsory courses*

- i. Research Work 2 (6CP RU)
- ii. Inorganic Chemistry (2CP RU)
- iii. Chemistry (2CP RU)
- iv. Advanced Fluid Dynamics (5CP RU)
- v. Advanced Heat and Mass Transfer (5CP RU)
- vi. Mechanical Process Engineering (5CP RU)
- vii. Chemical Reaction Engineering (5CP RU)

(b) *selected courses*

None

(c) *facultative course*

- i. Modern German Language (1CP RU)

A part of the aforementioned courses may be taught by a teacher from OVGU at KNRTU- KAI, usually in March, on mutual agreement six months prior to the semester.

3. semester at the Faculty of Process and Systems Engineering at OVGU

(a) *compulsory courses*

- i. Research Practice and Research Work 3 (Laboratory Work and Excursions) (10CP ECTS)
- ii. Thermal Process Engineering (5CP ECTS)
- iii. Process System Engineering (5CP ECTS)
- iv. Combustion Engineering (5CP ECTS)
- v. Plant Design (5CP ECTS)

4. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) *compulsory courses*

- i. Research Practice (as a Part of Master Thesis) (27CP RU)
- ii. Master Thesis Preparation and Defence (3CP RU)

The thesis will be defended in English at KNRTU-KAI. The teachers from OVGU can attend personally or via video conference.

2.2 Program 2015/2016 (1st year of studies) and 2016/2017 at KNRTU-KAI and 2016/2017 at OVGU and following years

1. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) compulsory courses

- i. Research Work 1 (6CP RU)
- ii. Pedagogical Practice (3CP RU)

(b) selected courses

- i. Philosophical Problems of Science and Technics (2CP RU)
- ii. Professional Foreign (English) Language (3CP RU)
- iii. Mathematical Modeling (4CP RU)
- iv. Methodology of Heat Engineering Researches (3CP RU)
- v. Industrial Safety and Ecology (5CP RU)
- vi. Computer and Information Technologies in Science and Industry (4CP RU)

(c) facultative course

- i. Philosophy (1CP RU)

2. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) compulsory courses

- i. Research Work 2 (9CP RU)
- ii. Chemistry (4CP RU)
- iii. Advanced Fluid Dynamics (4CP RU)
- iv. Advanced Heat and Mass Transfer (4CP RU)
- v. Mechanical Process Engineering (5CP RU)
- vi. Chemical Reaction Engineering (4CP RU)

(b) selected courses

None

(c) facultative course

- i. Business Foreign (German) Language (1CP RU)

A part of the aforementioned courses may be taught by a teacher from OVGU at KNRTU- KAI, usually in March, on mutual agreement six months prior to the semester.

3. semester at the Faculty of Process and Systems Engineering at OVGU

(a) *compulsory courses*

- i. Research Practice (Laboratory Work and Excursions) (10CP ECTS)
- ii. Thermal Process Engineering (5CP ECTS)
- iii. Process System Engineering (5CP ECTS)
- iv. Combustion Engineering (5CP ECTS)
- v. Plant Design (5CP ECTS)

4. semester at the Institute of Aviation, Land Vehicles and Energetics at KNRTU-KAI

(a) *compulsory courses*

- i. Research Practice (as a Part of Master Thesis) (9CP RU)
- ii. Pre-graduation practice (as a Part of Master Thesis) (15CP RU)
- iii. Master Thesis Preparation and Defence (6CP RU)

The thesis will be defended in English at KNRTU-KAI. The teachers from OVGU can attend personally or via video conference.

3 Grades

3.1 Acknowledgement of grades of KNRTU-KAI in the certificates of OVGU

3.1.1 Preamble

The collaborative master program is formally treated as "Teilstudium" — i. e., the courses taken at KNRTU-KAI are acknowledged and in conjunction with the courses taken at OVGU lead to the regular Master degree of the program Chemical and Energy Engineering. The rules in the governing documents of this program apply.

3.1.2 Equivalent courses

Program 2014/2015 and 2015/2016 (2nd year of studies) at KNRTU-KAI and 2015/2016 at OVGU

In the following, the courses listed in the corresponding section 2.1 are referenced.

- *compulsory courses*
 - Pedagogical Practice (6CP ECTS): course 1(a)iv acknowledged as equivalent
 - Research Work 2 (5CP ECTS): course 2(a)i acknowledged as equivalent
 - Chemistry (5CP ECTS): both courses 2(a)ii and 2(a)iii together acknowledged as equivalent, the grade is averaged with equal weight of both parts
 - Master Thesis (30CP ECTS): both courses 4(a)i and 4(a)ii together acknowledged as equivalent, the grade is taken from course 4(a)ii only
- *selected courses*
 - English Language (3CP ECTS): both courses 1(b)i and 1(b)ii together acknowledged as equivalent, the grade is averaged with equal weight of both parts

Program 2015/2016 (1st year of studies) and 2016/2017 at KNRTU-KAI and 2016/2017 at OVGU and following years

In the following, the courses listed in the corresponding section 2.2 are referenced.

- *compulsory courses*
 - Research Work 2 (5CP ECTS): course 2(a)i acknowledged as equivalent
 - Chemistry (5CP ECTS): course 2(a)ii acknowledged as equivalent
 - Advanced Fluid Dynamics (5CP ECTS): course 2(a)iii acknowledged as equivalent
 - Advanced Heat and Mass Transfer (5CP ECTS): course 2(a)iv acknowledged as equivalent
 - Chemical Reaction Engineering (5CP ECTS): course 2(a)vi acknowledged as equivalent
 - Master Thesis (30CP ECTS): courses 4(a)i, 4(a)ii and 4(a)iii together acknowledged as equivalent, the grade is taken from course 4(a)iii only

In all of the rest courses number of CP ECTS is equivalent to number of CP RU.

3.1.3 Equivalent grades

KNRTU-KAI	→	OVGU	
<i>minimum</i>		<i>grade</i>	<i>designation</i>
0%		5,0	failed
51%		4,0	sufficient
55%		3,7	sufficient
60%		3,3	satisfactory
65%		3,0	satisfactory
70%		2,7	satisfactory
75%		2,3	good
80%		2,0	good
85%		1,7	good
90%		1,3	very good
95%		1,0	very good

3.2 Acknowledgement of grades of OVGU in the certificates of KNRTU-KAI

3.2.1 Equivalent courses

Program 2014/2015 and 2015/2016 (2nd year of studies) at KNRTU-KAI and 2015/2016 at OVGU

In the following, the courses listed in the corresponding section 2.1 are referenced.

- *compulsory courses*
 - Research Practice (4CP RU): part of course 3(a)I acknowledged as equivalent, the grade is given on the basis of student report on Research Practice
 - Research Work 3 (6CP RU): part of course 3(a)i acknowledged as equivalent, the grade is given on the basis of student report on Research Work 3

Program 2015/2016 (1st year of studies) and 2016/2017 at KNRTU-KAI and 2016/2017 at OVGU and following years

In the following, the courses listed in the corresponding section 2.2 are referenced.

- *compulsory courses*
 - Research Practice (9CP RU): course 3(a)i acknowledged as equivalent

In all of the rest courses number of CP RU is equivalent to number of CP ECTS.

3.2.2 Equivalent grades

see section 3.1.3.

Signatures

On behalf of OVGU Magdeburg

Prof. Helmut Weiss
Coordinator of the
MSc Program in CEE



On behalf of KNRTU-KAI

Prof. Victor Gureev
Coordinator of the
MSc Program in CEE

