

Master of Science (M.Sc.) in Combustion Engines

The programme *Master of Science in Combustion Engines* focuses on all disciplines within Combustion Engines (Energy Engineering), including

- Thermodynamics,
- Fluid Dynamics,
- Heat Transfer,
- Energy Conversion Technology,
- Combustion,
- Control management,
- System Planning.

RWTH is well renowned for its continuous and innovated research in all areas of engineering, which ensures that the Energy Engineering curriculum is always up-to-date and maintained to the highest level.

The programme is comprised of compulsory and elective subjects.

Compulsory subjects cover the fundamentals of the chosen specialization, in this case energy technology. This includes:

- Combustion Engines,
- Alternative Vehicle Propulsion,
- Combustion II,
- Piston Compressors,
- Engine Acoustics.

For the elective subjects, students can choose from one of several possibilities in the field of Thermal Engineering, Turbo Machines/Jet Propulsion, Combustion Engines or Power Plant Technology.

Career Opportunities

Graduates will be qualified to work in a multitude of different areas of industry, including research and development, design, manufacturing and production. In granting the RWTH Master Degree, the programme gives the graduate a degree that is recognised world-wide and qualifies for further PhD studies.

Your Contact:

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Preface

Within in the last 100 years industrialization has been ensured by the introduction of outstanding inventions like the steam or the combustion engine. They have originally been invented in order to release men of heavy labor. Since then man has made these technologies available for everybody everywhere. In order to meet human energy demands engineers are facing a huge challenge converting energy with high efficiency, minimum pollution and less exploitation of earth resources possible, today and in future.

Furthermore industry is expanding their frontiers all over the world and thus demanding flexibility and mobility of their employed engineers – foreign languages already belong to the standard equipment of today's young professionals. International education forming intercultural thinking is required, which is the reason why the Master of Science Programme in Mechanical Engineering has been set up. Every year hundreds of highly qualified international students from all over the world are invited to join two years of modern education and interesting studies at the University of Technology Aachen, which is well reputed for its science and engineering fields of research and strongly related to industrial application.

The city of Aachen as the most western city of Germany, situated in the "Euregio", only a few kilometers away from the Dutch and Belgian boarder is an enjoyable place to live, as it provides its 40000 students with many cultural programmes and social activities.

I hope that this brochure awakes your interest to join the Master Courses in Aachen and that you take advantage of the information offered.

Univ. Prof. Dr.-Ing. Stefan Pischinger, Scientific Director



Structure of the Programme

This programme is comprised of three semesters of lectures, exercises, seminars, and laboratory courses. The fourth and last semester consists of an industrial internship (nine weeks) and a four month period devoted to prepare a master's thesis. The programme is especially designed for international students and offers particular services aimed at this target group:

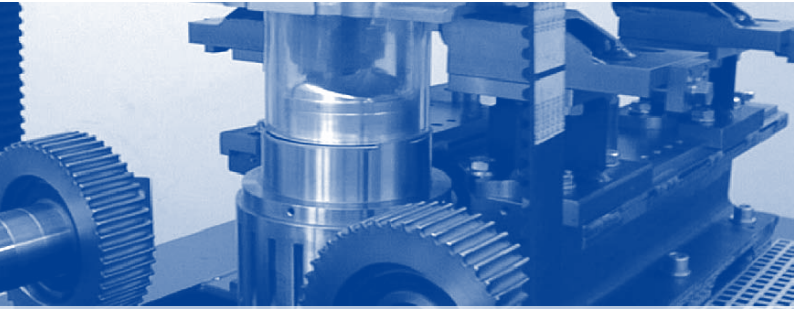
- **Content Coaching**

The participants of the master programme will benefit from personal coaching on all issues regarding the contents of the course. The students will find assistance with the preparation and the wrap-up of classes as well as the preparation of exams.

- **Social Coaching**

The content coaching will be complemented by an extensive social coaching on a broad spectrum of issues. The aim is to create an efficient learning and working environment at the study place Aachen. Support is offered from the admission all the way to graduation and beyond.

An integral part of the programme is the student exposure to industry-related activities. This includes a mandatory industrial internship of nine weeks, and the opportunity to take part in applied research projects. In addition to course work, students will complete both a mini thesis and a master's thesis on a subject related to Energy Engineering. The mini thesis can be completed parallel to course work, while the master's thesis is a four months programme and can be prepared either at RWTH University or in cooperation with an industrial partner.



Subjects of the Programme

To achieve a Master of Science in Combustion Engines, students have to satisfy certain requirements by taking 14 compulsory courses, selecting one technical elective (the non-technical elective is the German Language course). Additionally for an introduction into industrial employment an internship of nine weeks has to be done followed by a mini thesis and a master's thesis at the end of the studies. These offer the opportunity to either deepen one's favorite engineering science area, or possibly engage in an applied case study of a real industrial problem.

The programme *Master of Science in Combustion Engines* provides in-depth knowledge and understanding of energy technology, energy systems, and energy-related processes. It particularly focuses on industrial R&D practice and modern energy production, conversion and distribution processes. The programme also aims to enhance the students' ability to lead and co-ordinate project teams, and to strengthen their skills in scientific documentation and communication.

Energy engineers work in a multitude of areas within energy and power industry or within automotive industry, including research and development, design, sales and distribution, quality management and organization. In granting the M.Sc. degree the programme gives the graduate a degree which is recognized around the world.

	SUBJECT	ECTS Credits	SWH	
COMPULSORY COURSES	Automatic Control	8	5	
	Internal Combustion Engine Fundamentals & Energy Conversion Machinery	10	6	
	Combustion I	5	5	
	Energy Economics	5	3	
	Heat and Mass Transfer	8	5	
	Fluid Dynamics	5	4	
	Combustion Engines I, II	10	8	
	Combustion II	3	2	
	Alternative Vehicle Propulsion Systems	4	3	
	Automotive Engineering I	4	3	
	Pumps and Compressors	4	3	
	Engine Acoustics	5	4	
	Total Compulsory Courses		71	51
	Technical Elective Course		5	4
German Language Course		6	4	
Industry-related Activities		9	9 weeks	
Mini thesis		9	260h	
Master's thesis		20	4 months	
TOTAL		120	59	

SWH = numbers of hours per week per semester



Organisational Information

Duration of Study:	4 semesters (2 years)
Next Start:	every year, 1st of October + 6 weeks before start: German Course
Master Certificate:	Master Certificate of RWTH Aachen University
Master Degree:	M.Sc. (Master of Science) in Combustion Engines
Tuition Fee:	3700 € per semester
Scientific Director:	Univ.-Prof. Dr.-Ing. Stefan Pischinger Institute for Combustion Engines (VKA) of RWTH Aachen University
Place of Study:	Aachen, RWTH Aachen University

Prerequisites

A candidate should have a recognized first degree (Bachelor of Science or Engineering) in an engineering discipline such as Mechanical or Energy Engineering awarded by an internationally recognized university-level institution. Candidates should have also performed above average in their undergraduate studies. The Graduate Record Examination (GRE) is required. The candidates must be able to speak and write fluently in English (TOEFL 550 paper-based / 213 computer-based or IELTS 6.0). Please check our website for special entrance requirements.

RWTH Aachen University

RWTH Aachen University is the largest university of technology in Germany and one of the most renowned technical universities in Europe, with around 28,000 students, more than half of which are in engineering. Every year numerous international students and scientists come to the RWTH Aachen to benefit from the internationally recognised world-class courses and facilities. Almost 5,000 international students are currently enrolled within the undergraduate, graduate or PhD programmes. The proximity of Aachen to the Netherlands, Belgium and Luxembourg combined with the subsequent exposure to a variety of cultural heritages has placed RWTH Aachen University in a unique position with regards to the reflection and promotion of international aspects and intensive interaction with other universities.

Please send your application
until 1st of March to:

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