Wireless, Photonics and Space Engineering with their many applications are large industries and strong research fields both in Sweden and worldwide.

The master’s programme will prepare you for a career in this field through studies of wireless and optical communication components and systems, RF and microwave engineering, photonics (phenomena and applications utilizing photons), and space science and techniques.
PROGRAMME AIM
During the past decade, photonics and wireless technology have grown at an exceptional rate. The backbone of modern telecom infrastructure consists of optical fibre-based systems in combination with wireless technology, some of it on satellites to provide global coverage.

The investments in future telecom systems will have a profound impact on social and economic development. Medical applications of photonics and microwave technology are numerous, and measurement applications include radar, environmental monitoring and radio astronomy. Space systems aid our everyday life; television broadcast, navigation and weather forecasts are well-known examples.

WHO SHOULD APPLY
The programme is intended for physics and electrical engineering students interested in the technology and science of this fascinating field. Through semi-compulsory courses, students can specialize in wireless, photonics or space engineering, or a combination thereof.

WHY APPLY
The programme offers a unique opportunity to study a combination of subjects where Chalmers has world class facilities: Onsala Space Observatory with radio telescopes and equipment to study the Earth and its atmosphere, the Nanofabrication Laboratory with a cleanroom for micro and nanotechnology and state of the art photonics and microwave measurement equipment in research laboratories.

INDUSTRIAL CONNECTIONS
The Swedish industry has a strong tradition in wireless, photonics and space engineering, with the Swedish wireless industry largely situated in the Gothenburg region. The programme benefits from the close collaboration between the industry and Chalmers, with many courses having guest lecturers from industry, as well as visits to industrial sites and industrially relevant projects. It is common that the student carries out the final master’s thesis project at the R&D department of a company, thereby bridging the transition to a professional career.

The programme is a part of Chalmers Information and Communication Technology Academy which is an organized interface between Chalmers and ICT industry. The ICT Academy arranges seminars on the latest industrial topics, supports students and teachers in getting access to industrial projects, field trips, internships etc., and keeps the education in line with the continuously developing needs of the industry.

RESEARCH CONNECTIONS
Chalmers has internationally renowned research laboratories in wireless, photonics, and space science. The research includes such topics as semiconductor based microwave and millimetre wave electronics, semiconductor lasers for communication and sensors, advanced instruments for radio astronomy and environmental science, signal- and image processing of wave propagation and scattering from different eco-systems, fibre optical transmission for very high data rates, such as 40 and 160 Gb/s, power amplifiers and transmitters for wireless communication, and antennas for line-of-sight and multipath systems. Together the research laboratories cover applications and phenomena of electromagnetic waves on all frequencies from microwaves to visible light.

CAREER
The programme provides a master's education for a future career in engineering branches that rely heavily on electromagnetic waves, e.g. telecommunication, automotive electronics, space engineering, medical applications of microwaves and photonics, remote sensing, solid state lighting, environmental monitoring, navigation, and radio astronomy. You will find career opportunities in industry, at research institutes, or at universities.

UNDERGRADUATE PROFILE
Electrical Engineering, Engineering Physics, Physics, Engineering Mathematics.

PREREQUISITES
Mathematics 30 cr. (including Linear algebra, Multivariable calculus and Fourier analysis) and Electromagnetic field theory. Recommended course experience: High frequency electromagnetic waves.
ENGLISH LANGUAGE PROFICIENCY

There are three main ways to fulfil English proficiency requirements at Chalmers:
• Approved English language tests:
  IELTS (academic training): 6.5 (with no part of the test below 5.5), TOEFL (paper based): 575 (with a minimum of 4.5 on the written part), TOEFL (Internet based): 90 (with a minimum of 20 on the written part)
• English from upper secondary/high school that meets the requirements.
• English from previous university studies that meets the requirements.

Information and application at www.chalmers.se/en

PROGRAMME OVERVIEW

The two-year (120 cr.) programme starts with five compulsory courses that form a common foundation in wireless, photonics and space engineering. Through semi-compulsory courses, students can then specialize in wireless, photonics or space engineering, or a combination thereof. To provide opportunities to study related fields, there is also a wide range of elective courses. A master’s thesis project concludes the studies, where the student spends about 20 weeks on a project, working either for a university or an industrial R&D department.

WIRELESS, PHOTONICS AND SPACE ENGINEERING

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<th>Year 1</th>
<th>Year 2</th>
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<td>Autumn</td>
<td>Spring</td>
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<td>Electromagnetic Waves &amp; Components</td>
<td>Microwave Engineering</td>
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<td>Wireless and Photonics System Engineering</td>
<td>Space Science and Techniques</td>
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<td>Remote Sensing</td>
<td>Radar Systems and Applications</td>
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<td>Mm-wave &amp; THz Techn.</td>
<td>Design of MMIC</td>
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<td>Fiber Optical Communic.</td>
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CHALMERS UNIVERSITY OF TECHNOLOGY

Chalmers conducts research and education in engineering and natural sciences, architecture, technology-related mathematical sciences and nautical sciences – in close collaboration with industry and society. Chalmers is one of Sweden’s largest universities of technology with about 12,000 students and 2,200 employees.

Approximately 40 percent of Sweden’s graduate engineers and architects are educated here. Chalmers has formed partnerships with major industries mostly in the Gothenburg region such as Ericsson, Volvo and SKF.

The Master’s Programmes at Chalmers are strongly linked to advanced research in areas of particular strength. Upon completion of studies, candidates will be granted a Master’s degree. The programmes are taught in English and open to applicants from the whole world.

Chalmers has eight areas of advance where the aim is to bring together research, education and innovation across departmental boundaries and to cooperate with bodies and organisations outside Chalmers: Materials Science, Production, Information & Communication Technology, Transport, Built Environment, Nanoscience & Nanotechnology, Life Science and Energy. The eight key areas also have a firm foundation in the basic sciences. The pursuit of new knowledge and improved technology has characterized Chalmers ever since its foundation in 1829.

www.chalmers.se/en

THE SMALL METROPOLIS – GOTHENBURG

More than 60,000 are currently studying in Gothenburg. In many ways, their decision to choose Gothenburg when the time came to take the next step into the future isn’t surprising. Gothenburg is an attractive major city with a maritime atmosphere and within easy reach of outdoor activities in the rest of West Sweden.

Gothenburg is an uncommonly inviting city for students, with a great deal to offer: You’ll find an exciting cultural and entertainment scene worthy of any major city, as well as a friendly atmosphere that will help you to quickly feel at home.

Chalmers University of Technology, SE-412 96 Gothenburg, Sweden, Phone +46 31 772 1000

“Chalmers – for a sustainable future is a vision which exudes the long-term approach, the acceptance of responsibility and the trust I feel is worthy of Chalmers. At the same time, it is obvious that this vision has to be shared by many and that Chalmers has to cooperate across disciplines in order to promote the whole of society’s commitment to our future.”

Karin Markides, president

SWEDEN – A CULTURE OF INNOVATION

One of the world’s most modern countries, Sweden is the birthplace of many successful international corporations. Innovative research at Swedish universities and companies has resulted in a number of successful inventions. Some examples are: the computer mouse, Bluetooth for internet mobility, the pacemaker, the ball bearing, the Tetra Pak beverage packaging system, the dialysis machine and internet applications such as the online music streaming service Spotify and the free internet calling service Skype. These fairly recent inventions build on a long history of excellence in academia and research. Sweden is the home of the prestigious Nobel Prize, awarded in Stockholm every year.

Sweden has a number of large multinational corporations, such as telecom supplier Ericsson, automotive companies Volvo and Scania, household appliances corporation Electrolux, bearing manufacturer SKF, and high-tech engineering groups Sandvik and Atlas Copco. The deep-rooted creative environment has made Sweden a strong nation in the areas of design, fashion and music, with well-known international brands such as furniture giant IKEA and clothes retailer H&M. Sweden is also one of the largest music-exporting countries in the world.

www.studyinsweden.se

Founded in 1621, Gothenburg is a young city by European standards. Since formative years it has been an important port of international trade and today it is the largest in Scandinavia. With a population of about half a million, it is both friendly and cosmopolitan.

www.goteborg.com