



## HÖGSKOLAN I GÄVLE

### Master Programme in Electronics/Automation 120 cr

*Masterprogram i elektronik med inriktning mot automationsteknik 120 hp*

Set by -

#### Version

Set at	Valid from
8/28/13	ST14
10/11/13	ST14
5/14/18	HT18
8/23/19	HT20

<b>Education level</b>	Second cycle
<b>Programme code</b>	TAEAA
<b>Credits</b>	120 cr
<b>Diary number</b>	HIG-UTB 2013/14

#### Programmespecific objectives

The education is based on scientific lines and proceeds from the students active responsibility for studies. Great emphasis is put on an active search for knowledge and a personal development. On completion of studies the student shall have a high academic competence and be prepared for continued research studies. After the education the student shall have good knowledge and skills to develop, construct, realise and implement systems in microwave technology, signal processing and antenna theory.

Moreover students of the Master's degree programme in Electronics shall on completion of the education understand and be able to put into practice advanced technical solutions that require

- very good ability in sensors and measurement technology
- very good ability in multivariable and non-linear systems
- very good ability in robotics
- very good ability in computerized image processing and machine vision

As well as specific factual knowledge the student shall have

- experience of work in projects, with problem analysis, the formulation of problems, problem solving and evaluation
- experience in working in international groups as the education recruits students from different parts of the world.

<b>Target</b>	<p>A Degree of Master of Arts/Science (120 credits) is awarded after the student has completed the courses required to gain 120 credits with a defined specialisation determined by each higher education institution itself, of which at least 60 credits are for specialised study in the principal field (main field of study) of the study programme. In addition the prior award of a Degree of Bachelor's degree, Degree of Bachelor's degree in fine arts, professional or vocational qualification of at least 180 credits or a corresponding qualification from abroad is required.</p> <p>The requirement of the prior award of a qualification may be waived for a student admitted to the programme without the basic entry requirement in the form of a qualification. This does not, however, apply if a waiver was granted during admission pursuant to the second paragraph of Section 28 of the Chapter 7 of the Higher Education Ordinance (1993:100) on the grounds that the qualification had not yet been issued.</p>
<b>Knowledge and understanding</b>	<p>For a Degree of Master of Arts/Science (120 credits) the student shall</p> <ul style="list-style-type: none"> <li>demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and</li> <li>demonstrate specialised methodological knowledge in the main field of study.</li> </ul>
<b>Skills and abilities</b>	<p>For a Degree of Master of Arts/Science (120 credits) the student shall</p> <ul style="list-style-type: none"> <li>demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information</li> <li>demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work</li> <li>demonstrate the ability in speech and writing both nationally and internationally to report clearly and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and</li> <li>demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.</li> </ul>
<b>Judgement and attitudes</b>	<p>For a Degree of Master of Arts/Science (120 credits) the student shall</p> <ul style="list-style-type: none"> <li>demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work</li> <li>demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and</li> <li>demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.</li> </ul>
<b>Content and structure</b>	<p>The programme is 120 credits and leads to a Master of Science Degree in Electronics. The programme concludes with a thesis.</p>
<b>Other degree</b>	<p>Independent project (degree project)</p> <p>A requirement for the award of a Degree of Master of Arts/Science (120 credits) is completion by the student of an independent project (degree project) for at least 30 credits in the main field of study. The degree project may comprise less than 30 credits, however no less than 15 credits, if the student has already completed an independent project in the second cycle for at least 15 credits in the main field of study or the equivalent from a programme of study outside Sweden.</p>
<b>Degree title</b>	<p>Master of Arts/Science (120 Credits)</p>
<b>Prerequisites</b>	<p>A completed Bachelor's degree, corresponding to a Swedish Bachelor's degree (180 ECTS), or equivalent academic qualifications from an internationally recognised university.</p> <p>Electronics as Major (90 ects) or equivalent and at least 30 ects mathematics (including</p>

Linear algebra and multivariable analysis )as well as a course in signal processing.

English language proficiency equivalent to (the Swedish upper secondary school) English course B/6.

### Year 1

Period	Identifier	Title	Level	Credits	Field
1:1	EEA005	<i>Statistical Signal Processing</i>	A1N	7.5 cr	Electronics
1:1	FYG500	<i>Applied Mechanics II</i>	G2F	7.5 cr	Physics
1:2	EEG503	<i>RF Measurement Technology</i>	G2F	7.5 cr	Electronics
1:2	EEA004	<i>Multivariable and Nonlinear Control Systems</i>	A1N	7.5 cr	Electronics
1:3	EEA308	<i>Computerized Image Processing and Machine Vision</i>	A1F	7.5 cr	Electronics, Computer Science
1:3	EEA001	<i>Wireless Sensor Networks</i>	A1N	7.5 cr	Electronics
1:4	EEA003	<i>Robotics</i>	A1N	7.5 cr	Electronics
1:4	EEG507	<i>Ethics in Technical Development</i>	G2F	7.5 cr	Electronics

### Year 2

Period	Identifier	Title	Level	Credits	Field
2:1	EEA002	<i>Sensors and Measurement Technology</i>	A1N	7.5 cr	Electronics
2:1	IEG501	<i>Industrial Statistics</i>	G2F	7.5 cr	Industrial Economics
2:2	EEA307	<i>Advanced Projects in Electronics</i>	A1F	7.5 cr	Electronics
2:2	EEA312	<i>Advanced Digital Control Systems</i>	A1F	7.5 cr	Electronics
2:3	EE470D	<i>Master's Thesis in Electronics</i>	A2E	30 cr	Electronics