

## Master of Engineering, Autonomous Maritime Operations (60 cr)

Degree: **Högre yrkeshögskoleexamen i sjöfart**

Qualification title: **Ingenjör (högre YH)**

Duration of studies: **2 years**

Study type: **Part-time** **F**

» [Generic competences](#)

**Kontaktuppgifter:** [Enheter](#) | [Utbildningsansvariga](#)

Code	Name	Cr/year/total					
		1	2	3	4	5	Total
AD PRO	<b>Advanced professional studies</b>						cr
AMO18MI	<b>Master Studies - Introduction</b> <i>The student:</i> <ul style="list-style-type: none"> <li>- has the necessary skills for distance studies and e-learning</li> <li>- develops an understanding about academic writing</li> <li>- knows a variety of research methods</li> <li>- understands maritime operations, and how Autonomous vessels and the fourth revolution of shipping will affect maritime operations including new business models in shipping.</li> <li>- can recognize maritime legislation and legal perspectives for autonomous vessels.</li> </ul>	5					5 cr
AMO18MI01	<ul style="list-style-type: none"> <li>• <b>Studying in the Master's Program</b></li> </ul> <i>The aim of the introduction is to ensure that the student is able to successfully work with the studies.</i>  <i>The student:</i> <ul style="list-style-type: none"> <li>- is able to use the e-learning platform</li> <li>- is aware of the characteristics of distance studies</li> <li>- knows how to submit materials</li> <li>- knows the principles of academic writing and referencing</li> <li>- is familiar with different tools for communicating lecturers</li> </ul>	1					1 cr
AMO18MI02	<ul style="list-style-type: none"> <li>• <b>Research and Research Methods</b></li> </ul> <i>The aim of the course is to give the student the tools for choosing a suitable method for the master's thesis.</i>  <i>The student:</i> <ul style="list-style-type: none"> <li>- has a deeper understanding about what research is, how it can be done, what it is used for, etc.</li> <li>- knows the importance of formulating research problems</li> <li>- knows how to write a research plan</li> <li>- is familiar with different research methods, emphasizing methods suitable for the industry</li> </ul>	1,5					1,5 cr
AMO18MI03	<ul style="list-style-type: none"> <li>• <b>Introduction to Marine Operations</b></li> </ul> <i>The student:</i> <ul style="list-style-type: none"> <li>- understands maritime operations, and how Autonomous vessels and the fourth revolution of shipping will affect maritime operations including new business models in shipping.</li> <li>- can recognize maritime legislation and legal perspectives for autonomous vessels.</li> </ul>	2,5					2,5 cr
AMO18AV	<b>Autonomous vessels – automation</b> <i>The Student:</i> <ul style="list-style-type: none"> <li>- has an overall picture about automation and control, what is automated today and what developments are likely or possible in the future.</li> <li>- can recognize what technology and different solutions is needed for autonomous vessels.</li> <li>- can recognize what new risks the autonomous vessels will face and how they can be mitigated.</li> </ul>	5					5 cr
AMO18AV01	<ul style="list-style-type: none"> <li>• <b>Autonomous vessels – automation</b></li> </ul> <i>The Student:</i> <ul style="list-style-type: none"> <li>- has an overall picture about automation and control, what is automated today and what developments are likely or possible in the future.</li> <li>- can recognize what technology and different solutions is needed for autonomous vessels.</li> <li>- can recognize what new risks the autonomous vessels will face and how they can be mitigated.</li> </ul>	5					5 cr
AMO18AI	<b>Artificial Intelligence, Machine Learning, Human - Machine Interaction</b> <i>The Student</i> <ul style="list-style-type: none"> <li>- has an basic understanding of AI and the history of AI.</li> <li>- has knowledge of where AI is used and its development today.</li> <li>- has an basic understanding of different machine learning algorithms and their future possibilities</li> <li>- can recognize different inputs used in AI and machine learning</li> <li>- recognises the possibilities to get information and data from different systems and how Human - Machine Interaction is adapted in autonomous vessels</li> </ul>	5					5 cr

AMO18AI01	<p><b>• Artificial Intelligence, Machine Learning, Human - Machine Interaction</b> <i>The Student</i></p> <ul style="list-style-type: none"> <li>- has an basic understanding of AI and the history of AI.</li> <li>- has knowledge of where AI is used and its development today.</li> <li>- has an basic understanding of different machine learning algorithms and their future possibilities</li> <li>- can recognize different inputs used in AI and machine learning</li> <li>- recognises the possibilities to get information and data from different systems and how Human - Machine Interaction is adapted in autonomous vessels</li> </ul>	5					5 cr
AMO18CS	<p><b>Cyber security and Connectivity</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- understand risk management and information security.</li> <li>- understands current main threats to cyber security and connectivity in shipping and autonomous vessels.</li> <li>- has gained capabilities to mitigate risks in information security and cyber security.</li> <li>- understands possibilities and limitations of connectivity for autonomus vessels.</li> </ul>	5					5 cr
AMO18CS01	<p><b>• Cyber security and Connectivity</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- understand risk management and information security.</li> <li>- understands current main threats to cyber security and connectivity in shipping and autonomous vessels.</li> <li>- has gained capabilities to mitigate risks in information security and cyber security.</li> <li>- understands possibilities and limitations of connectivity for autonomus vessels.</li> </ul>	5					5 cr
AMO18RO	<p><b>Remote Operations</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- is able to recognize different Human Factors involved in Remote operations</li> <li>- is familiar with existing surveillance and fleet management operation centres</li> <li>- knows how to perform and communicate during Remote monitoring and operations</li> <li>- understands the existing technology used in remote operations</li> </ul>		5				5 cr
AMO18RO01	<p><b>• Remote Operations</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- is able to recognize different Human Factors involved in Remote operations</li> <li>- is familiar with existing surveillance and fleet management operation centres</li> <li>- knows how to perform and communicate during Remote monitoring and operations</li> <li>- understands the existing technology used in remote operations</li> </ul>		5				5 cr
AMO18CQ	<p><b>Classification, qualification and safety perspectives</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- is familiar with classification processes and requirements developed by national and international maritime authorities of autonomous vessels.</li> <li>- has an overall picture of safety and security on autonomous vessels including risk assessment, processes and risk handling.</li> <li>- understands the role &amp; responsibilities of ship masters / operators and ship owners.</li> </ul>		5				5 cr
AMO18CQ01	<p><b>• Classification, qualification and safety perspectives</b> <i>The student</i></p> <ul style="list-style-type: none"> <li>- is familiar with classification processes and requirements developed by national and international maritime authorities of autonomous vessels.</li> <li>- has an overall picture of safety and security on autonomous vessels including risk assessment, processes and risk handling.</li> <li>- understands the role &amp; responsibilities of ship masters / operators and ship owners.</li> </ul>		5				5 cr
<b>Master's Degree Thesis</b>							cr
AMO18MT	<p><b>Master's Thesis</b> <i>The master's thesis is a demanding development project or research work combining theory, practise and creating new knowledge. The topic and aim of the thesis are based on the needs and demands of the industry.</i></p> <p><i>The Student</i></p> <ul style="list-style-type: none"> <li>* is able to combine theoretical framework and practice with the contextual needs in a development or research project</li> <li>* is able to network and communicate professionally with relevant organisations and</li> </ul>	10	20				30 cr

	<i>industry representatives</i> <i>* is able to critically evaluate sources and methods, select the suitable ones and use them systematically and ethically</i> <i>* is able to document, report and give a presentation of the project or research status and the final results</i>						
	<b>Master's Degree Thesis</b>	10	20				30 cr
AMO18MT01	<b>• Master's Thesis - Part 1</b> <i>Master's Thesis 1</i>  <i>The student</i> <ul style="list-style-type: none"> <li>- can plan and develop a suitable objective and research project</li> <li>- can choose a suitable method for the project</li> <li>- has written a description of the research problem following principles in academic writing</li> <li>- can present the thesis project</li> <li>- is able to revise the project after receiving feedback.</li> </ul>	10					10 cr
AMO18MT02	<b>• Master's Thesis - Part 2</b> <i>Master's Thesis 2</i> <i>At the second stage the process continues by gathering information and combining the theoretical framework and empirical work. A meaningful development project is based on the requirements of working life commissions.</i>  <i>The student</i> <ul style="list-style-type: none"> <li>- is able to critically evaluate the used sources and methods</li> <li>- can select applicable sources and uses them systematically</li> <li>- is able to use the methods chosen for the project</li> <li>- is able to self-evaluate and discuss work(s) in progress</li> <li>- can present and discuss work(s) in progress.</li> </ul>		10				10 cr
AMO18MT03	<b>• Master's Thesis - Part 3</b> <i>The student:</i> <ul style="list-style-type: none"> <li>- masters the methods and practices used in the maritime industry and is able to complete a thesis</li> <li>- is able to document the final results and report the project according to good ethical principles</li> <li>- is capable to give a presentation as well as to publish the thesis</li> </ul>		10				10 cr
		10	20				cr
ELEC	<b>Elective Studies</b>						cr