



FORSVARET

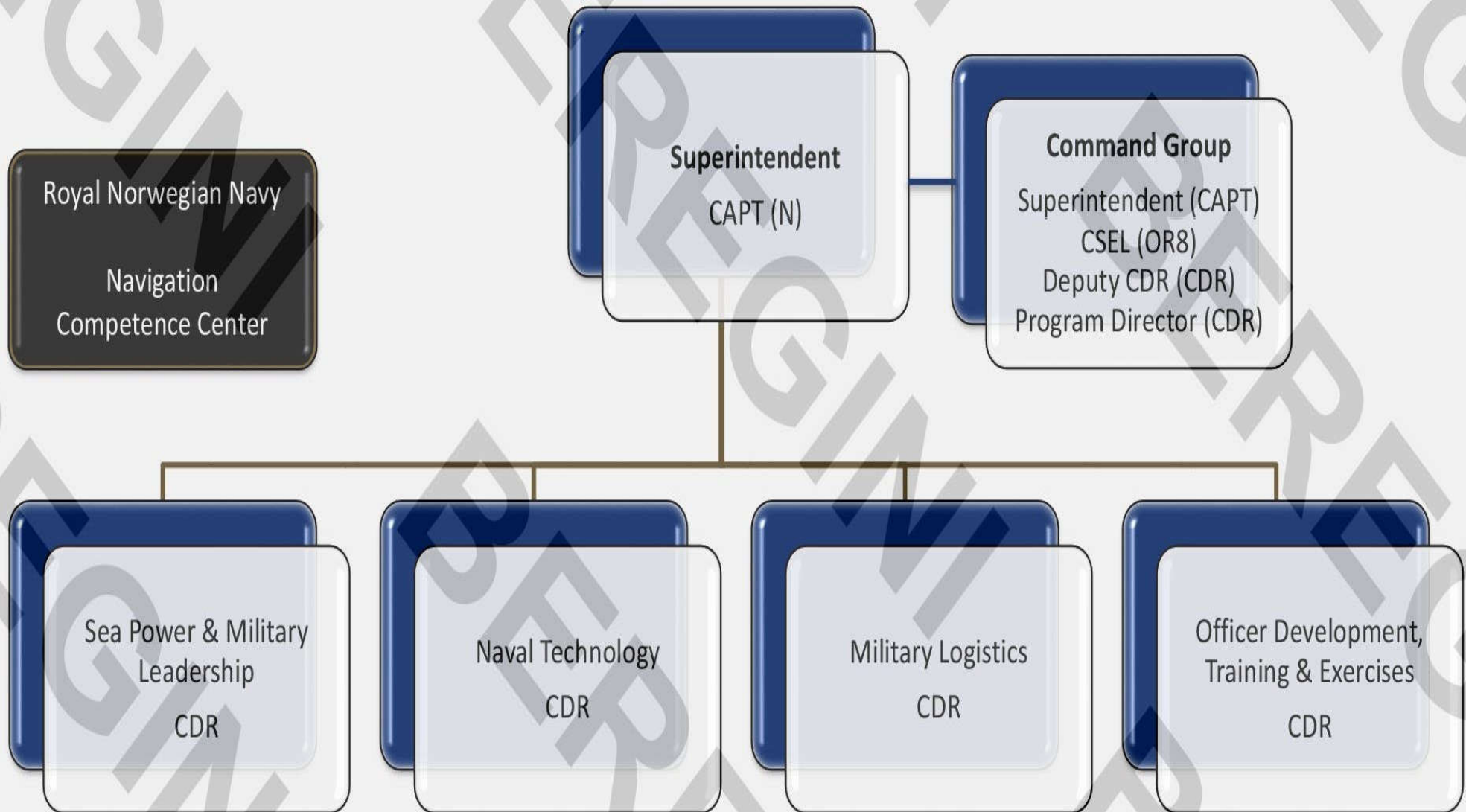
Forsvarets høyskole / Sjøkrigsskolen

# Royal Norwegian Naval Academy

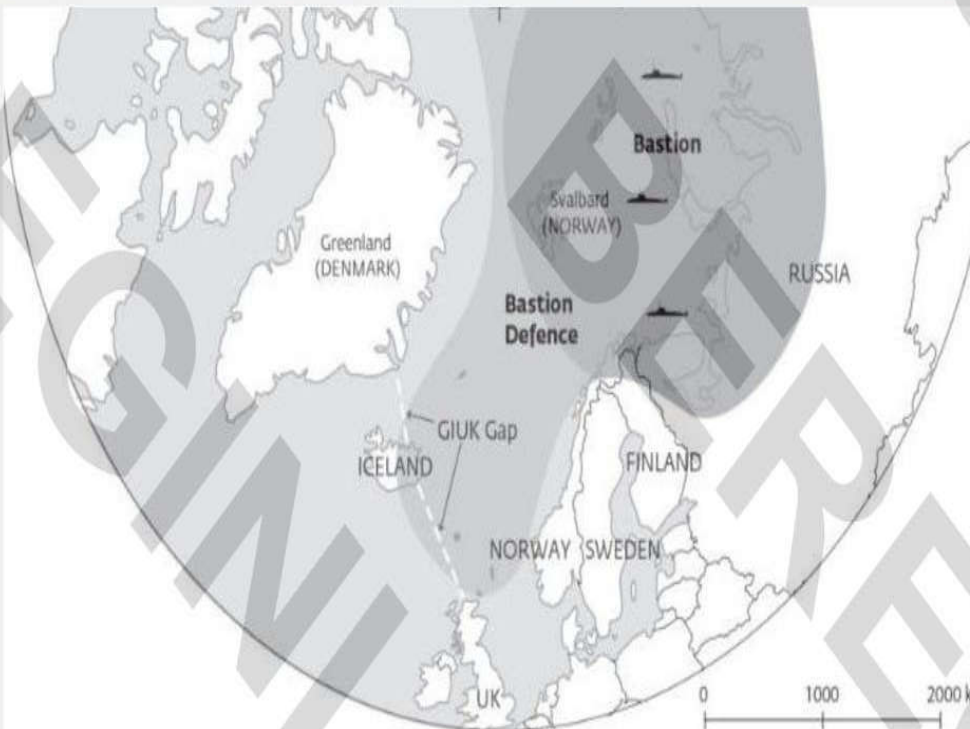




*Norwegian Defense University College*  
*Royal Norwegian Naval Academy*



## Shaping warriors for operations in the Arctic



## ARCTIC ROUTES OPENING TO COMMERCIAL VESSELS



■ 2015 summer sea ice

□ 2015 winter sea ice

— Northeast Passage

2009: First commercial journey

2018: First journey without icebreaker

— Northwest Passage

2013: First commercial journey

— Transpolar Sea Route

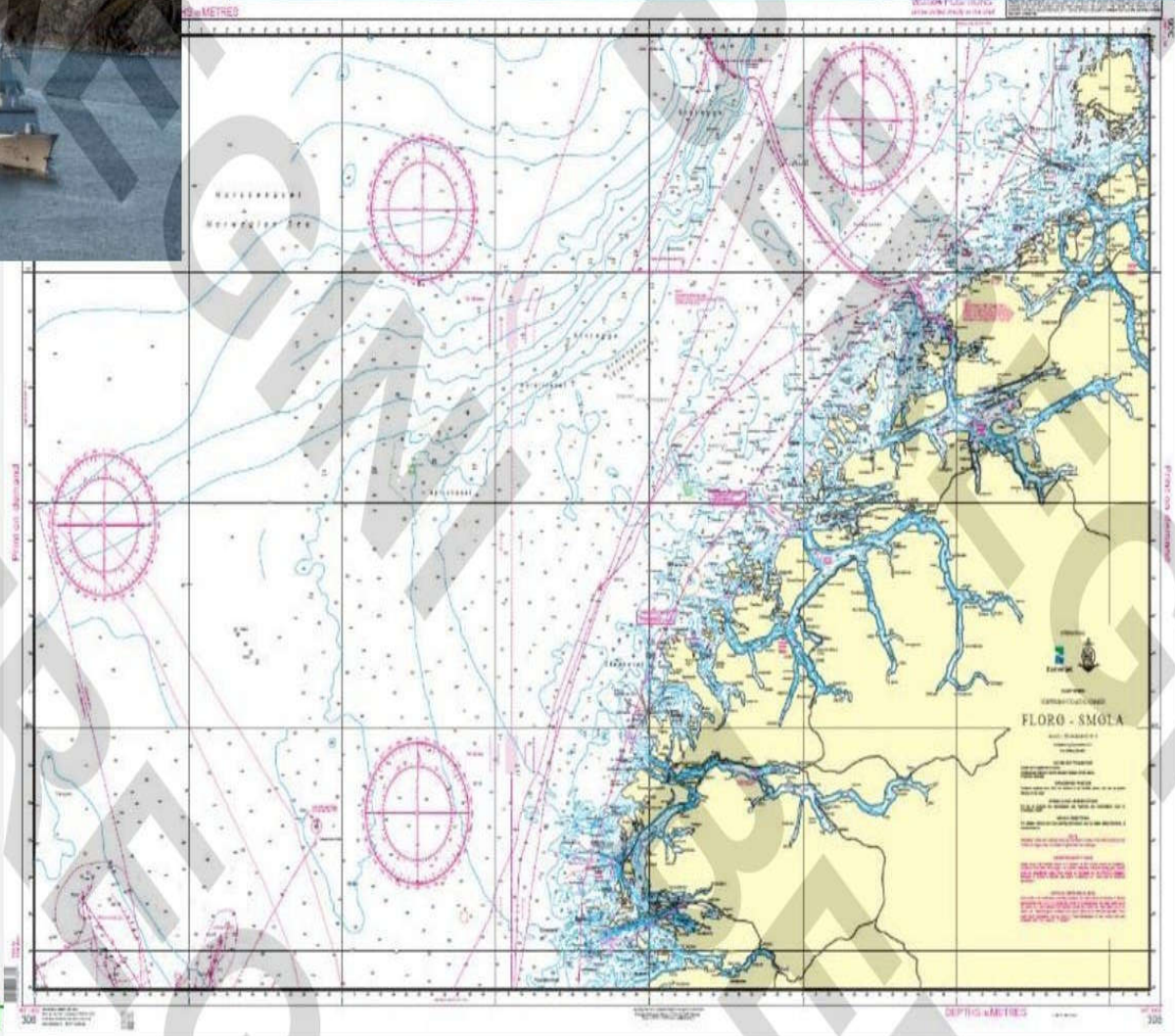
2030: Expected to open

HORIZON

Data source: NOAA, THE ARCTIC INSTITUTE

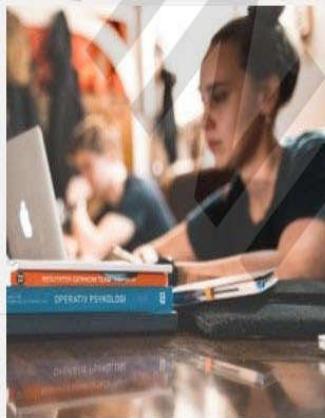


# Operating in the Arctic elements





**Warfighting & Officer  
development**  
*The Defence Act*  
Ministry of Defense



**Maritime Certificates**

*The Ship Safety Act + STCW*  
Norwegian Maritime Directorate  
International Maritime Organization

**Accreditation**

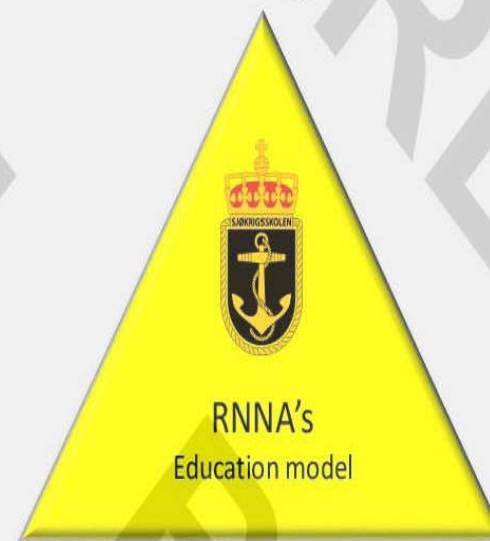
*Act relating to Universities  
and University Colleges*  
Ministry of Education and  
Research



**Engineering**

*Regulation on the Framework Curriculum  
for Engineering Education*  
Ministry of Education and Research

**Theory**



**Guidance & reflection**

**Practice**

## ***RNNA program tracks***

- Bachelor in military studies – Specialization in Naval Leadership and Navigation
- Bachelor in military studies – Specialization in Leadership and...
  - Naval Engineering – Machine Branch
  - Naval Engineering – Weapons Branch
  - Military Logistics
  - Military Power and Security Operations
- Bachelor in Engineering – Electrical Power and Automation (OR)



## *Other studies*

- **Personnel w/civilian bachelor's degree**
  - Basic Officer Supplement (“anyone”)
    - 2 years, including 1 year practice
  - Basic Officer Supplement (at least 3 years as OR5)
    - 5 months
- **Other Ranks (OR)**
  - Senior Enlisted Education 1 – to become OR6
    - 12 weeks
  - Senior Enlisted Education 2 – to become OR7
    - 12 weeks
- **Supporting NDUC's master's degree**
  - Sea Power
  - Military Logistics



## *Status*

- Defense education reform implemented in 2018:
  - One program
  - 1. year + joint operations
  - 180 ECTS
  
- Norwegian Defense University College ambitions
  - Bologna process (standardization)
  - Compliance with Norwegian laws and regulations
  - Learning outcomes (LOs)
  - Outsourcing
  - Internationalization
  - Research & Development





# Common activities (all military academies)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1. year		Basic Soldier Skills	MILM1110 Basic Officer Competency 7,5 ECTS	MILM1111 The Officer, the State & the War 22,5 ECTS			MILM1X01 The basics of Military Power 15 ECTS			MILM1X02 Military Problem-solving and Analysis 15 ECTS		
2. year												
3. year		OPS3101 Basic Joint Operations 15 ECTS										

# Common activities (RNNA)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1. Year		Basic Soldier Skills MILM1110 Basic Officer Competency 7,5 ECTS		MILM1111 The Officer, the State & the War 22,5 ECTS			MILM1301 The basics of Sea power Ex Sea Legs (Tall ship journey) 15 ECTS		MILM1302 Military problem-solving and analysis Ex Naval Archimedes 15 ECTS			Ex Sea Warrior
2. Year		Ex Kairos										Ex Sea Warrior
3. Year		OPS3101 Basic Joint Operations 15 ECTS			Ex Marops							Ex Sea Warrior
4. Year												



# Military Logistics

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN																																																																		
1. Year	<table><tr><td rowspan="3">Basic Soldier Skills</td><td>MILM1110 Basic Officer Competency</td><td colspan="2">MILM1111 The Officer, the State &amp; the War</td><td colspan="2">MILM1301 The basics of Sea power</td><td colspan="2">MILM1302 Military problem-solving and analysis</td><td rowspan="3">Ex Sea Warrior</td></tr><tr><td>7,5 ECTS</td><td>22,5 ECTS</td><td colspan="2">Ex Sea Legs (Tall ship journey)</td><td colspan="2">Ex Naval Archimedes</td></tr><tr><td></td><td></td><td></td><td></td></tr></table>												Basic Soldier Skills	MILM1110 Basic Officer Competency	MILM1111 The Officer, the State & the War		MILM1301 The basics of Sea power		MILM1302 Military problem-solving and analysis		Ex Sea Warrior	7,5 ECTS	22,5 ECTS	Ex Sea Legs (Tall ship journey)		Ex Naval Archimedes																																																				
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Bachelor's thesis, collection of data, interviews, courses																																																																														

# Naval Engineering

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
1. Year		Basic Soldier Skills	MILM1110 Basic Officer Competency  7,5 ECTS	MILM1111 The Officer, the State & the War  22,5 ECTS		MILM1301 The basics of Sea power  Ex Sea Legs (Tall ship journey)  15 ECTS			MILM1302 Military problem-solving and analysis  Ex Naval Archimedes  15 ECTS		Ex Sea Warrior ING0312 + ING0320 Workshop (2 weeks)		
2. Year	ING0312 + ING0320 Workshop (2 weeks)	ING0314 Workshop (3 weeks)	ING2303 Marine Electrical Engineering  7,5 ECTS			ING0322 Machine technical engine workshop (6 weeks)	ING2307 Mathematical Methods in Practice  7,5 ECTS			ING0323			
			ING2301 Functions, Differential Equations and Numerical Methods  7,5 ECTS				ING2309 Thermo Dynamics and Heat Transfer  7,5 ECTS						
			ING2302 Dynamics and Chemistry  10 ECTS				ING2310 Marine Electrical Installations  7,5 ECTS						
			ING2305 Fluid and Hydro Dynamics  7,5 ECTS				ING2308 Statics and Mechanics of Materials  7,5 ECTS						
3. Year	ING0323	OPS3101 Basic Joint Operations  15 ECTS	ING3303 Naval Vessels, Buoyancy and Construction  7,5 ECTS			ING0324	ING3311 Machine Design and Materials Science  12,5 ECTS						
			ING3302 Applied Linear Algebra and Statistics  7,5 ECTS				ING3304 Marine Control Systems, Regulation and HMI  7,5 ECTS						
			ING3320 Maritime law with law of the sea  5 ECTS				ING3310 Marine Turbo Machinery  10 ECTS						
			ING3314 Marine Propulsion Machinery  7,5 ECTS										
4. Year	ING0326	ING3392 Marine Machinery systems and survivability  10 ECTS			Graduation etc	ING0326 Post-RNNA: iaw STCW requirements 20 weeks functional education/practice, workshop							
		OPG3301 Bachelor's Thesis  20 ECTS											

Ugradert – kan deles eksternt med godkjenning fra informasjonseier. Skal ikke publiseres åpent.



# Naval Engineering – Weapons Branch

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
<b>1. Year</b>		Basic Soldier Skills	MILM1110 Basic Officer Competency 7,5 ECTS	MILM1111 The Officer, the State & the War 22,5 ECTS		MILM1301 The basics of Sea power Ex Sea Legs (Tall ship journey) 15 ECTS			MILM1302 Military problem-solving and analysis Ex Naval Archimedes 15 ECTS		Ex Sea Warrior ING-031 2 ING-031 3	
<b>2. Year</b>		ING0321			ING2303 Marine Electrical Engineering 7,5 ECTS	OPS2301 Naval operations and tactics 7,5 ECTS		ING2307 Mathematical Methods in Practice 7,5 ECTS		ING-031 5		
					ING2301 Functions, Differential Equations and Numerical Methods 7,5 ECTS			ING2312 Analog Technology 7,5 ECTS				
					ING2302 Dynamics and Chemistry 10 ECTS							
					ING2304 Data Systems Technology and Programming 7,5 ECTS			ING2306 Computer Systems & Networks 7,5 ECTS				
<b>3. Year</b>		OPS3101 Basic Joint Operations 15 ECTS		ING3312 Weapon Engineering Electronics 7,5 ECTS		ING-031 6		ING3309 Signal Processing and Transmission 10 ECTS				
				ING3302 Applied Linear Algebra and Statistics 7,5 ECTS				ING3304 Marine Control Systems, Regulation and HMI 7,5 ECTS				
				ING3301 Electro Optics and Microwaves 7,5 ECTS				ING3306 Ship and combat systems automation 10 ECTS				
				ING3313 Electromagnetism and Signatures 7,5 ECTS								
<b>4. Year</b>	ING3391 Operation Rooms and Computer Networks 10 ECTS					Graduation, etc.		Post-RNNA 20 weeks functional education/practice, familiarization, workshop, etc in the Royal Norwegian Navy				
	OPG3301 Bachelor's Thesis 20 ECTS											

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2. Year		ING0321			ING2303 Marine Electrical Engineering 7,5 ECTS		ING2301 Functions, Differential Equations and Numerical Methods 7,5 ECTS		ING2302 Dynamics and Chemistry 10 ECTS		ING2304 Data Systems Technology and Programming 7,5 ECTS	
					OPS2301 Naval operations and tactics 7,5 ECTS		ING2307 Mathematical Methods in Practice 7,5 ECTS		ING2312 Analog Technology 7,5 ECTS		ING2306 Computer Systems & Networks 7,5 ECTS	
3. Year		OPS3101 Basic Joint Operations 15 ECTS			ING3312 Weapon Engineering Electronics 7,5 ECTS		ING3302 Applied Linear Algebra and Statistics 7,5 ECTS		ING3301 Electro Optics and Microwaves 7,5 ECTS		ING3313 Electromagnetism and Signatures 7,5 ECTS	
					ING3309 Signal Processing and Transmission 10 ECTS		ING3304 Marine Control Systems, Regulation and HMI 7,5 ECTS		ING3306 Ship and combat systems automation 10 ECTS			
4. Year		ING3391 Operation Rooms and Computer Networks 10 ECTS			OPG3301 Bachelor's Thesis 20 ECTS		Graduation, etc.		Post-RNNA 20 weeks functional education/practice, familiarization, workshop, etc in the Royal Norwegian Navy			

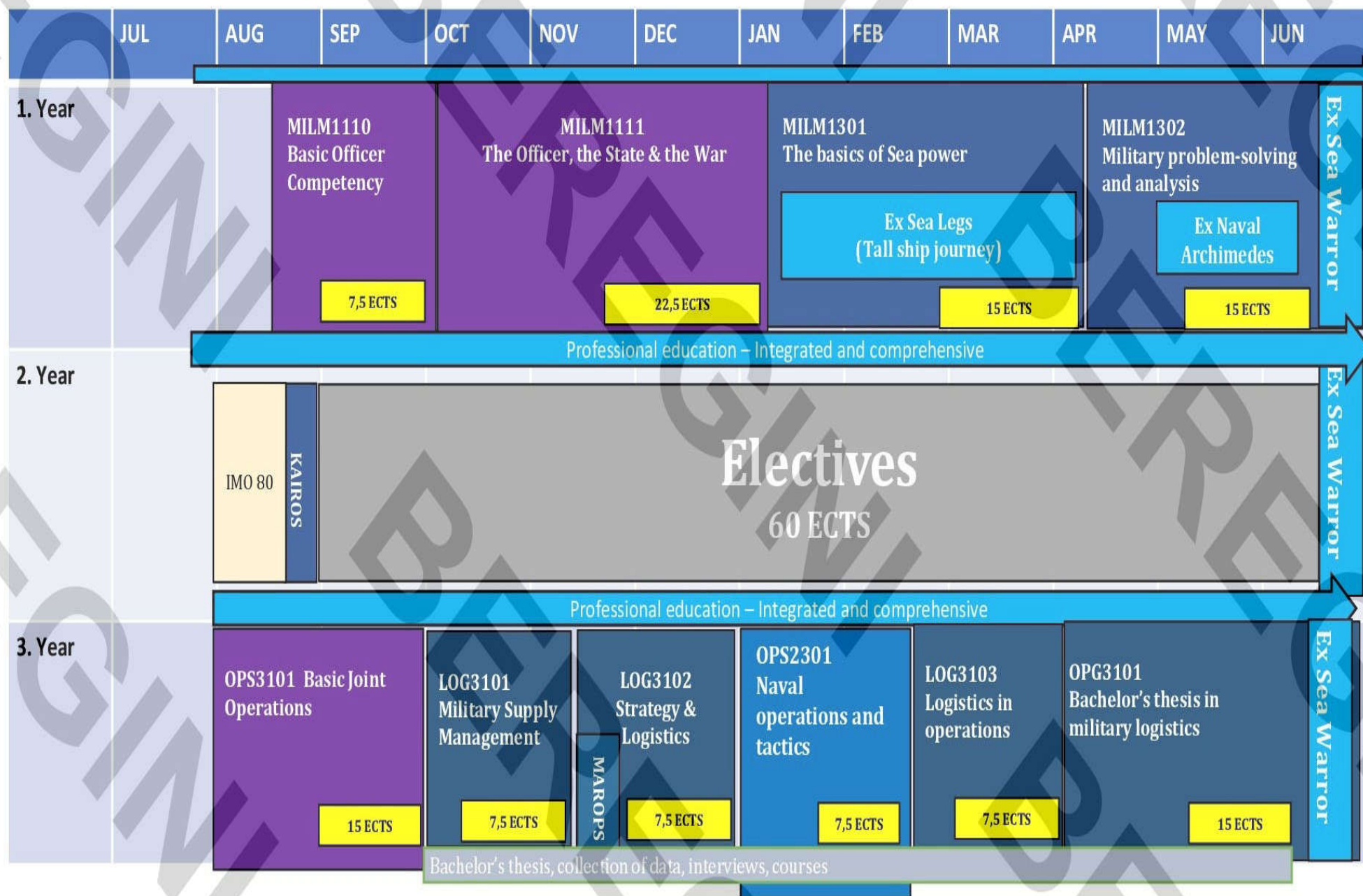
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					OPS2301 Naval operations and tactics 7,5 ECTS		ING2307 Mathematical Methods in Practice 7,5 ECTS		ING2312 Analog Technology 7,5 ECTS		ING2306 Computer Systems & Networks 7,5 ECTS	
3. Year		OPS3101 Basic Joint Operations 15 ECTS			ING3312 Weapon Engineering Electronics 7,5 ECTS		ING3302 Applied Linear Algebra and Statistics 7,5 ECTS		ING3301 Electro Optics and Microwaves 7,5 ECTS		ING3313 Electromagnetism and Signatures 7,5 ECTS	
					ING3309 Signal Processing and Transmission 10 ECTS		ING3304 Marine Control Systems, Regulation and HMI 7,5 ECTS		ING3306 Ship and combat systems automation 10 ECTS			
4. Year		ING3391 Operation Rooms and Computer Networks 10 ECTS			OPG3301 Bachelor's Thesis 20 ECTS		Graduation, etc.		Post-RNNA 20 weeks functional education/practice, familiarization, workshop, etc in the Royal Norwegian Navy			

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# Military Power and Security Operations





# Naval Leadership & Navigation

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
1. Year		MILM1110 Basic Military Competency 7.5 ECTS		MILM1111 The Officer, the State & the War 22.5 ECTS			IMO 60 MILM1301 The Basics of Sea Power Ex Sea Legs (Tall ship journey) 15 ECTS		MILM1301 Military Problem-solving and Analysis Ex Naval Archimedes 15 ECTS			IMO 1.15 CRYPTO Ex Sea Warrior
2. Year	Vacation		ING2320 Mathematics for Navigators 10 ECTS	ING2321 Physics for Navigators 1 7.5 ECTS			OPS2301 Naval Operations and Tactics 7.5 ECTS	ING3330 Physics & Chemistry <sup>5 SP</sup> NAV3310 Maritime comms <sup>5 ECTS</sup>	ING2322 Physics for Navigators 2 7.5 SP ING3320 Maritime Law & Law of the Sea 5 ECTS		Ex Sea Warrior	Ex West Coast Vacation
3. Year	Career Development, vacation		NAV2305 Meteorology & oceanography 5 ECTS	NAV2301 Military Navigational Watch 7.5 ECTS				Officer Development & Leadership (10 ECTS)	ING3316 Energy systems, Operations & Maintenance 5 ECTS	NAV3326 Mil. Practical Navigation 2 5 ECTS		Career Development, vacation
			NAV2323 Mil. Practical Navigation 1 NAV2307 Military Navigation 1 ING3331 Ship Engineering and Environment 15 ECTS						ING3315 Ship Loading and Unloading 10 ECTS	NAV2304 Military Navigation 2 5 ECTS NAV2303 Navigation Systems 1 5 ECTS		
4. Year	Career Development, vacation		OPS3101 Basic Joint Operations 15 ECTS	OPG 3304 Method 5 ECTS	Electives (min. 10 SP) Module(s) or parallel courses Min. 10 ECTS			Officer Development & Leadership (5 ECTS)	NAV3302 Navigation Systems 2 5 ECTS NAV3307 Military Navigation 3 5 ECTS NAV2324 Military Practical Navigation 3 5 ECTS	OPG3303 Bachelor's thesis 2.5 ECTS NAV3327 MEN 4 15 ECTS		Graduation, etc



# Questions?

