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Shipping Economics and Analytics-Introduction. L1

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About this lecture

- Course introduction
- Basic concepts
- Intro to our next lecture



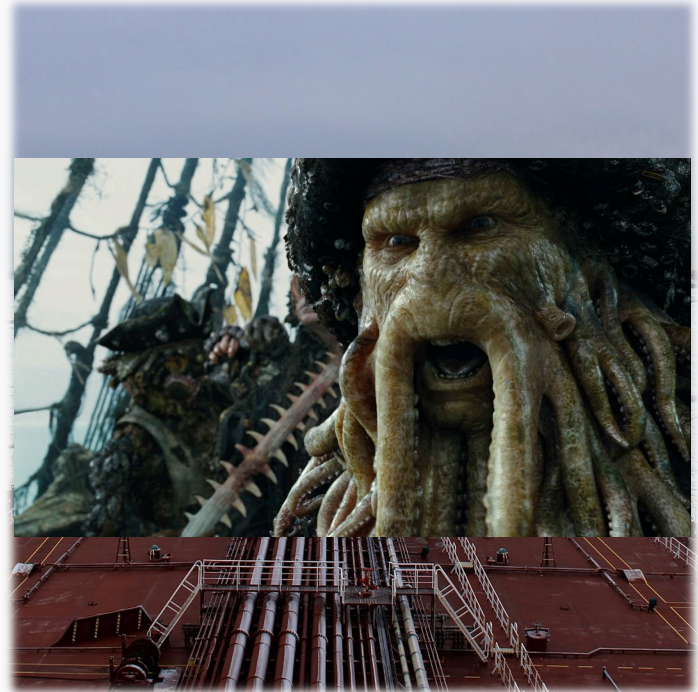
Learning outcomes

- Skills
 - Can communicate with industry practitioners using correct terminology
- Competency
 - Exchange opinions and experiences with others with a background in the field



Short intro

- Studies in:
 - MSc. Supply Chain Engineering – Georgia Tech
 - MSc. Shipping Management – World Maritime University
 - PhD Business & Management Science – NHH
- Advisor to the [MTCC Latin America](#) and the [UN Big Data task team in AIS data](#)
- Member of the Institute of Chartered Shipbrokers and the International Association of Maritime Economists
- Studied Nautical Science – then 5 years as a deck officer in oil tankers (Navigating the vessel, cargo handling, safety, etc.)



Source: Euronav

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Course basics

- Lecture times
 - Monday 12:15-14:00 (Aud. J)
 - Wednesday 10:15-12:00 (Aud. O)
- Office hours: by appointment (send me an email)
- Guest lecturers
 - Sebastian Raa and Jasmine Mehrad. Grieg Shipbrokers
 - Oliver Chaplin, AXS Marine
 - Angelos Vatikalos TBC. Signal Ocean



Readings and background material

- Canvas is our entry point and our validator to work on:
 - <https://ene431.logistikk.io> – Class recordings, lecture materials, slides, reading list for the lecture, glossary of terms, Python tutorials
 - <https://acad.logistikk.io> – Databases and Jupyter Notebooks (code)
 - Once you are set up (approved cookies). You could access the links directly
- Canvas remain as our communication environment (direct and broadcast messages, surveys)
- All readings required for the course are in Penum
 - If a book is not available, I will provide alternatives
- Group assignment tasks material to become available on Sep. 17th at <https://ene431.logistikk.io/pages/assignment.html> (link also accessible in Canvas course page)
- If you haven't checked out the introductory video in Canvas. Do it soon.



Databases

Source	Description	Access
Clarksons Shipping Intelligence Network	Freight rates, Congestion data, others	Create a Clarksons account and work at NHH (NHH wifi) or use an NHH VPN
Clarksons World Fleet Register	Vessel's specifications	
Synthetic Automatic Identification System (AIS) data from the UN Global Platform	Vessel tracking data	Through acad.logistikk.io for in class sessions (when necessary)
TradeWinds (Under negotiations)	Maritime news	Through NHH ip (NHH wifi)
AXS Marine	Commodities flow data	Through shared-storage
Copernicus Marine Services	Weather data	Through their platform. But I will provide with samples at acad.logistikk.io (shared-storage)
	Other databases	Through shared-storage

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Coding environments

- **acad.logistikk.io** for inclass analytics session
- **Local Jupyter in your laptop** – to review/play with codes and to use in the assignment

Date	Lecture	Subject	Lecturer	Readings
25-Aug	1	Course introduction	Gabriel Fuentes	
27-Aug	2	Shipping impact on the 2030 Agenda for Sustainable Development Goals and Human Rights	Gabriel Fuentes	
1-Sep	3	Freight market basics– supply and demand	Gabriel Fuentes	Stopford (2009) Ch.4 Adland et al. (2016)
3-Sep	4	The economics of shipping management	Gabriel Fuentes	Adland et al. (2020)
8-Sep * Online recorded session	5	Voyage calculations	Gabriel Fuentes	Panayides (2018). Ch 10. pp 203 to 212 + as many examples as needed
10-Sep	6	Shipping data, statistical analysis, and machine learning	Gabriel Fuentes	Yang et al. (2019) Adland (2021)
15-Sep	7	Climate risk and disruptions in the maritime transport	Gabriel Fuentes	Read the case study for the class (to become available on ene431.logistikk.io resources section). Fuentes and Munim (2025)
17-Sep	8	Financing of shipping assets and vessel	Gabriel Fuentes	Adland and Köhn (2019)



Date	Lecture	Subject	Lecturer	Readings
		valuation analytics: sale and purchase		
22-Sep	9	Freight derivatives and risk management	Gabriel Fuentes	Kavussanos and Visvikis (2008)
24-Sep	10	Shipping and commodity data for trade analytics	Oliver Chaplin (AXS Marine)	
29-Sep	11	Maritime environmental policy and green shipping.	Gabriel Fuentes	
1-Oct	12	Operational solutions for emissions reduction and CII estimation	Gabriel Fuentes	Fuentes and Adland (2023) <i>Optional:</i> Read after Fuentes and Adland (2023) [Poulsen and Sampson (2019)]
6-Oct	13	Chartering Practice / Bulk carriers chartering	Jasmin Mehrad and Sebastian Raa (Grieg Shipbrokers)	
8-Oct	14	Tanker's chartering	Gabriel Fuentes	Panayides (2018). Ch 7.
13-Oct	15	Commercial management and tools	Semiramis Assimakopoulo (Senior Vice President of Sales) / Angelos Vatikalos (Director of Strategic Business Development) / Signal Ocean	TBC
15-Oct	16	Commercial management and tools	Semiramis Assimakopoulo (Senior Vice President of Sales) / Kostantinos	TBC



20-Oct	Group work (no lecture)	
22-Oct	Group work (no lecture)	Essay + presentation submission
27-Oct	Oral exam (students' presentation)	
29-Oct	Oral exam (students' presentation)	
3-Nov	Oral exam (students' presentation)	
5-Nov	Oral exam (students' presentation <u>if needed</u>)	



About exams and assessment

- Group assignment (essay and presentation) to be submitted by **Oct. 22nd – 1200** (Wiseflow)
 - Topics available from **Sep 17th**
 - Groups of 2-4 students (Ready by **Sep 22nd**)
 - Unique topic per group selected by **Sep 22nd**
 - 30% for final grade from essay
 - 20% for final grade from oral exam/presentation in English only
 - Part of the learning outcome, so all students must be present for their presentation
- Home individual exam (50% of final grade) **Dec 18th**. Includes all material except for coding and data base manipulation (Exam in English language only)



Course content

- Pool operations
- Chartering strategy
- Operational strategy
- Environmental strategy

Freight market

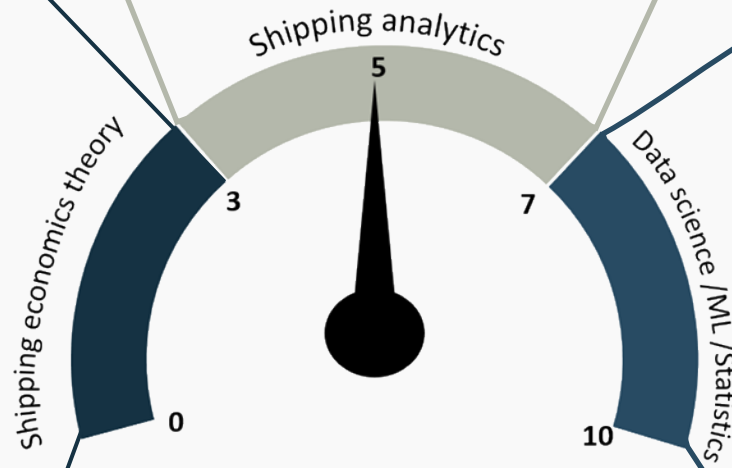
- Supply and demand
- Perfect competition
- Contracts

Operations

- Vessel performance
- Principal-agent prob.
- Value of time
- Derivatives and financial instruments

Sale and purchase market

- Vessel valuation
- Risk management



Methods

- Statistical analysis
- Data handling
- Outliers recognition
- Machine learning
- Big data handling
- Emissions estimation
- Trade estimation

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What will I learn?

- Talk the talk with industry experts
 - Which experts? (chartering, operations, finance, digital, IT, business intelligence, etc.)
 - You can choose later on what to specialize upon. This is a broad industry with different paths.
 - How? With proper terminology and concepts
- Apply economic theory to industry practice
- Be familiar with state-of-the-art research
 - Build curiosity and know what info is available
 - Get ideas for research (Master Thesis)
 - Lots of data
- Get a head start with cutting edge methods you might be using as a researcher or at industry

PAUSE



The obvious start. What is a ship?

“Any large floating vessel capable of crossing open waters, as opposed to a boat, which is generally a smaller craft” Britannica
“a large boat for transporting people or goods by sea” Oxfords Languages

The "one TEU" container ship

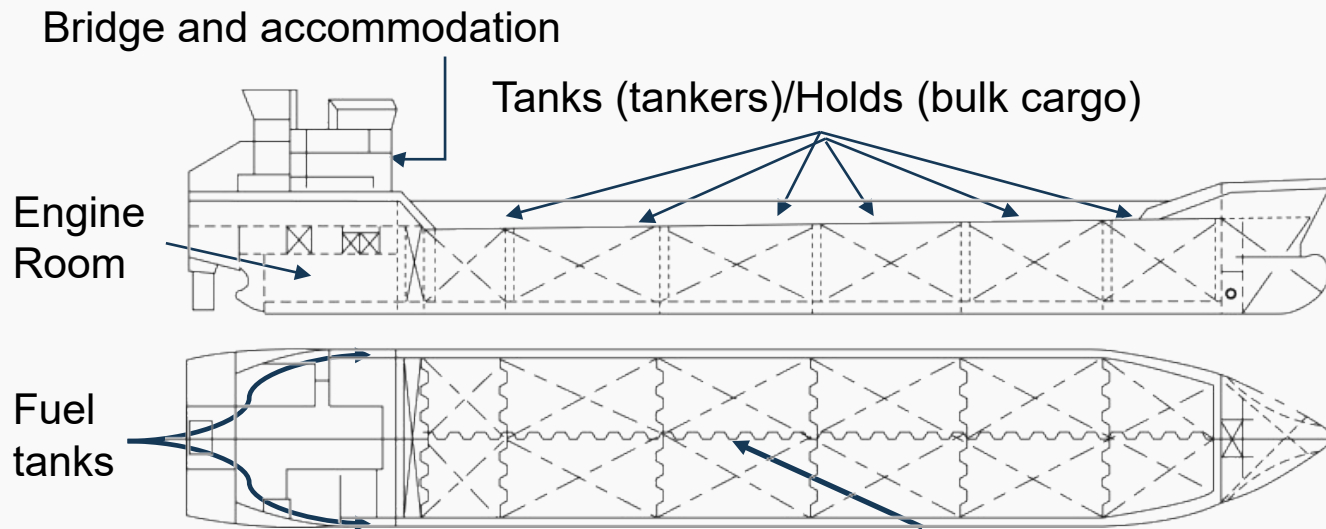


Source: George Droubi from Twitter



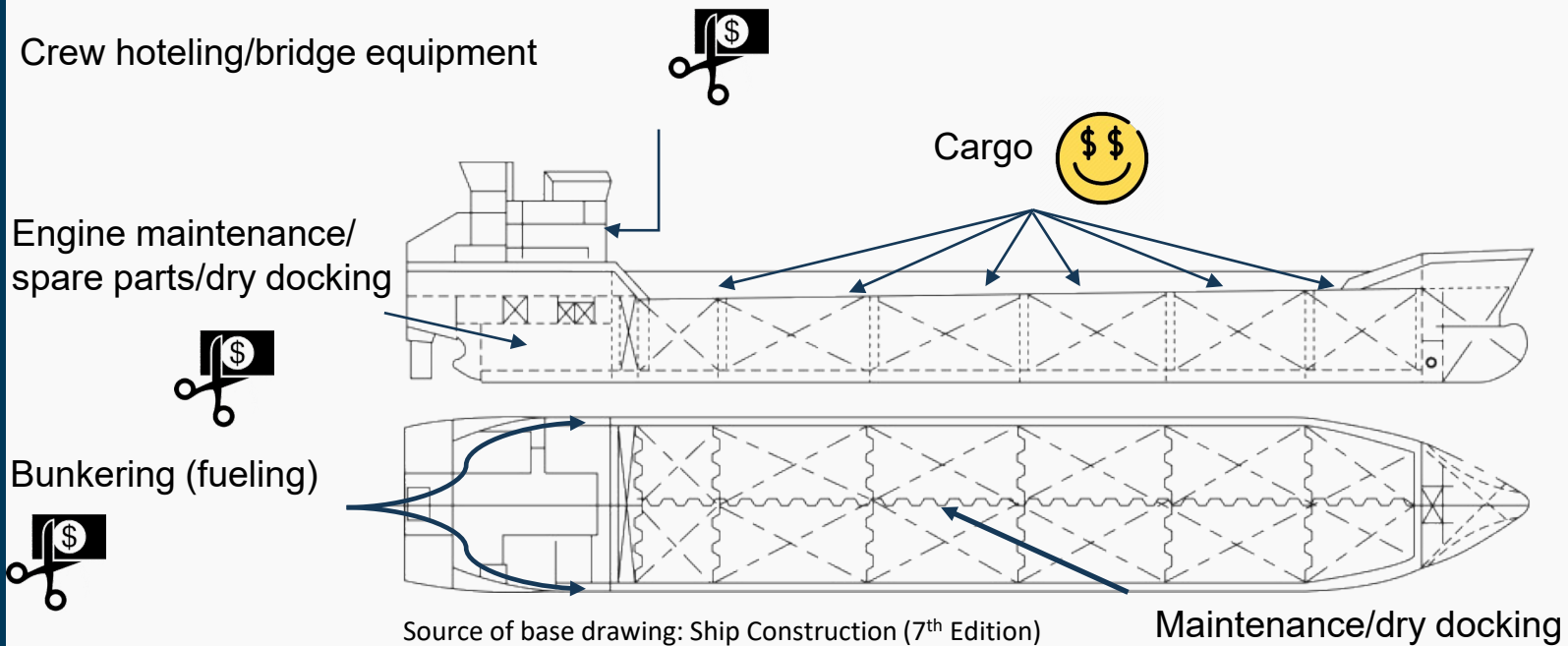
Source: Marine Link

The obvious start. What is a ship?



Source of base drawing: Ship Construction (7th Edition) Deck

The obvious start. What is a ship?



Plus:

- Flagging/ Registry
- Crew wages (ca. 20-25 people)
- Classification (DNV, ABS, BV)
- Inspections
- Insurance (Hull & Machinery, and Protection & Indemnity (P&I))

What is the shipping industry?

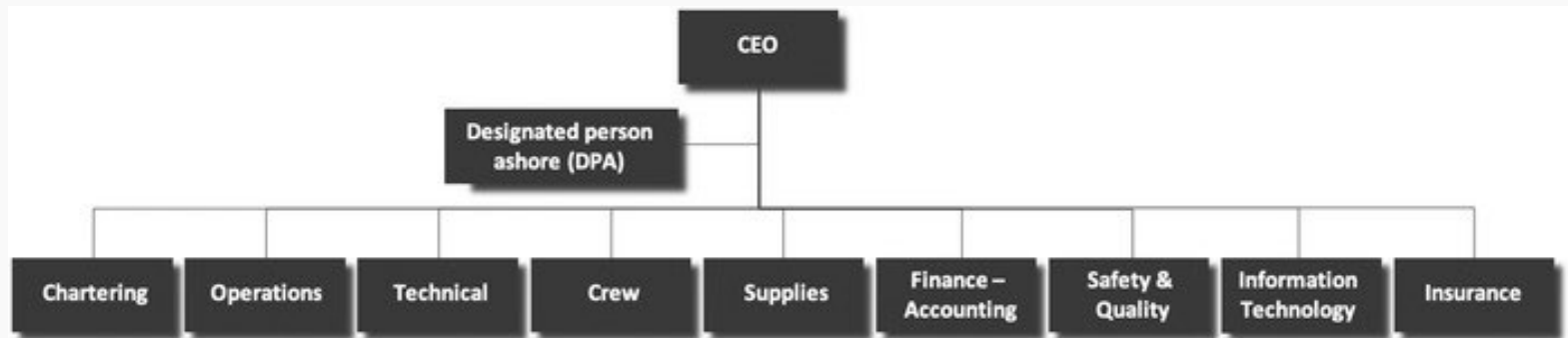


Source: Kusuma et al., 2019

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What is the shipping industry?



Source: Handbook of Maritime Management

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“Shipping minor” track in shipping

- Related master courses:
 - ENE431. Shipping Economics and Analytics (Autumn)
 - FIE460. Shipping Finance and Marine Insurance (Autumn)
 - ENE430. Commodity trading and transport ? (Spring)
- Master thesis within shipping
- “New” skills on demand for shipping companies and banks:
 - Data analytics (Machine learning-AI, Statistics, Communication)
 - Decision support
 - Programming
 - Econometrics

Where does people profit from shipping?

Owner

- Earning from voyage per voyage on a \$/tonne basis (spot charter) or by “renting” out the vessel on a \$/day basis (time charter) for a period
- As part of a door-to-door transport offer (e.g., Maersk, CMA CGM)

Chartering

- Dealing with a cargo owner and the shipowner. Renting a vessel's space and selling the transport space to the cargo owner.
- If the charter is the cargo owner, then by acquiring competitive transport for her cargo

Brokering

- As a middle party arranging business between a shipowner and a charterer, they earn a commission as a percent (2% to 5%) of the closed agreement. Guest lecturer on Sep 18th

Finance

- Shipping stocks are traded in NYSE, NASDAQ, OSE, SSE, etc.
- Shipbuilding loans (DNB)

Management

- By managing vessels on behalf of a ship owner
- Supplying crews to a vessel

Sale and Purchase

- Ship value also fluctuates. So, an old vessel can be sold at a higher price than when it was bought. More on that on Sep 17th lecture.

Others

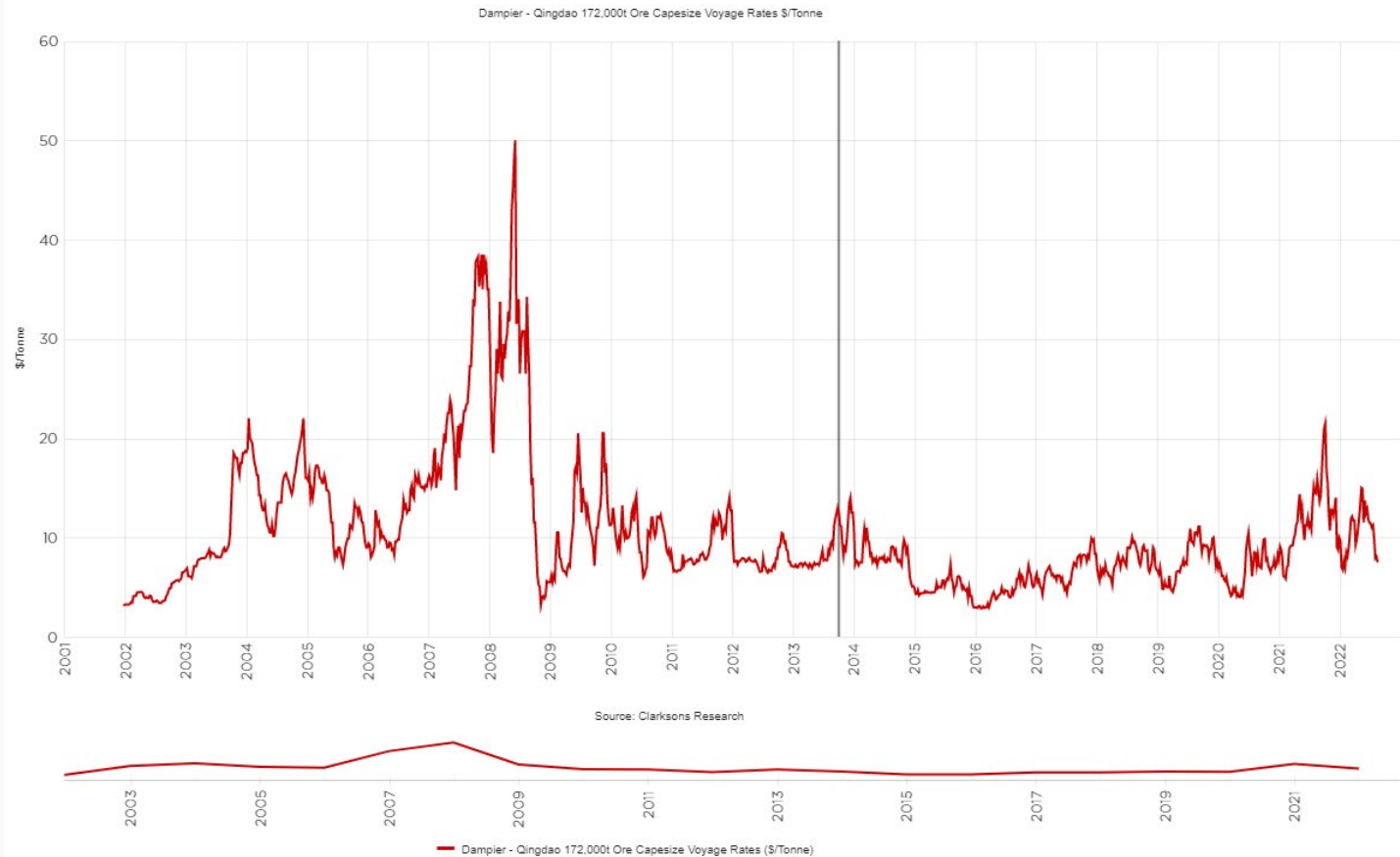
- Insurance, inspections, classification, victualling (Supplies-Bunkers), R&D, crew training, software development, many others.



Where does people lose from shipping?



Where does people lose from shipping?



Good to know



Norges
Rederiforbund
Norwegian
Shipowners'
Association

Norwegian Shipowners' Association's Fund at NHH

- Travel and study grants for master thesis work on shipping & offshore related topics
- Up to 15,000 NOK for individual thesis and 20,000 NOK per group
- Deadlines Nov 1, May 1, Feb 1
- Additional requirements at: <https://www.nhh.no/en/about-nhh/nhhs-funds/external-funds/>



Professional examination for applying for a membership

“Institute members are shipping's professionals”

- 7 exams including (shipping economics, operations, law, chartering, sale and purchase, etc.)
- Can be taken at Bergen in May (under request) and in Oslo in May and Nov (no request needed)
- If in need of mentoring, visit : <https://www.ics.org.uk/membership> for more info

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Thesis topics inspiration

- + IMPACT OF CLIMATE CHANGE ON VESSEL OPERATIONS
- + CLIMATE POLICY AND ITS EFFECT ON MARITIME TRADE
- + DECISION SUPPORT FOR MARITIME INVESTMENTS AMID UNCERTAIN CLIMATE POLICIES
- + DARK FLEET ECONOMICS IN GRAIN AND OIL TRADE
- + TOURIST MANAGEMENT
- + HELICOPTER FLEET COMPOSITION AND ALLOCATION
- + ELECTRIC VEHICLES: OPERATION, CHARGING, NETWORK, LOGISTICS
- + WHAT IS THE VALUE OF BETTER WEATHER FORECASTS?
- + TOPICS ON SHIPPING ECONOMICS AND FINANCE
- + TOPICS ON MARINE INSURANCE
- + EVACUATION OF LARGE PASSENGER SHIPS
- + CARGO SCHEDULING
- + ANALYSIS OF HIGH-FREQUENCY SUPPLY DATA FOR OIL TANKERS

<https://www.nhh.no/en/research-centres/shipping-and-logistics/topics-for-master-theses/>

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Thesis topics inspiration

Green Shipping Corridors at the Panama Canal

- Suggest the way forward to implement green shipping corridors passing through the Panama Canal as part of their decarbonization plans
- Topics within–Data Analytics, Energy Infrastructure Development (Green Fuels), Network Design, Pricing Mechanisms, Scheduling Models (OR), etc.
- Project in liaison with the Panama Canal, Liverpool John Moores University, Georgia Tech Panama Research Center, Maritime University of Panama, MTCC and the Technological University of Panama.
- If interested, let's have a chat



About our next lecture

- Shipping and its role on the 2030 Agenda for Sustainable Development and Human Rights
 - We will have a view on the policies surrounding shipping and their implications on vessel operations. We will highlight current initiatives addressing the UN Sustainable Development Goals and human rights concerns.
- Check the introduction videos at Canvas explaining the Canvas layout



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References

Kusuma, L. T. W. N., & Tseng, F. S. (2019). Analysis of the impact of the “Sea Toll” program for seaports: resilience and competitiveness. *Applied Sciences*, 9(16), 3407.

