

MEC-E1004 Principles of Naval Architecture

1st Mid term exam revision

Exam rules of engagement

- Open book, you may use the web and any calculator you like
- □ You might have to use the xls sheets you have been using for your assignment

□ You cannot text or call each other

- Multiple choice and essay questions to be answered over 3hrs
- 4 questions corresponding to lectures 1 5 + one bonus question

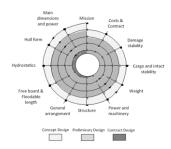
□ You have to submit online and on time !!!

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→ ¶	
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¶ Student ID · <u>Number::</u> •¶	
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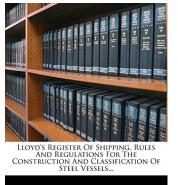


The Ship Design context

- Design parameters, variables and constraints
- □ The role of Rules and Regulations
- □ Shipping sustainability and green technologies
- □ Ship Design stages and the design spiral
- □ The importance of design innovation















General definitions and ship terminology

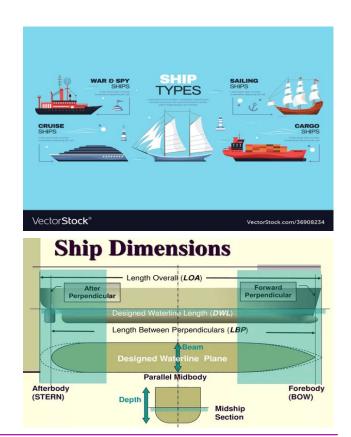
□ Different principles of categorizing a ship

Categorize your group deign project ship

□ Explain the use of *reference ship data*

Terminology !!! (e.g., speed, weight, tonnage, displacement, flags of convenience, form coefficients, general particulars)

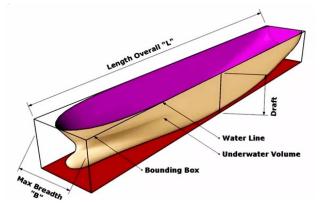
Evaluation of ship general particulars





Main dimensins and design coefficients

- What are the approaches to determine a ship's main dimensions
- What it means if a ship's capacity is (a) limited by weight, (b) limited by volume.
- Evaluation of ship design features using coefficients of form and main dimensions
- ❑ How can you use Ayre's formula to estimate the ship length and then calculate the block coefficient using Schneekluth formula ?



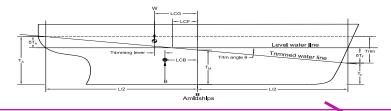


Hull forms and hydrostatics

□ Basic hull form related terminology

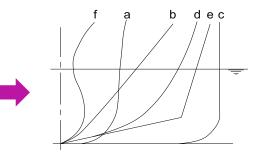
□ What factors need to be considered when determining the form of a ship's hull ?

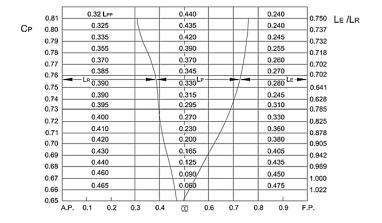
- □ What are the key relationships between form factors ?
- □ How you can apply the above knowledge to shape your ship's hull ?



Aalto University

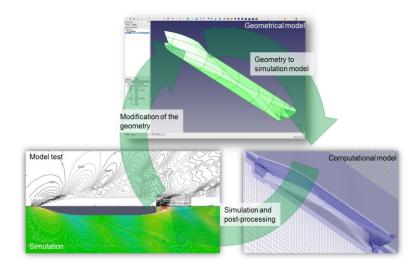
School of Engineering



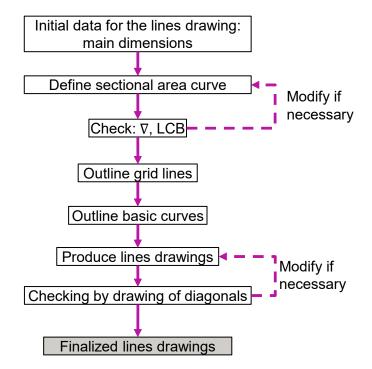


Basic definitions : LCG, LCF, LCB, trim...etc.

Hull forms and hydrostatics



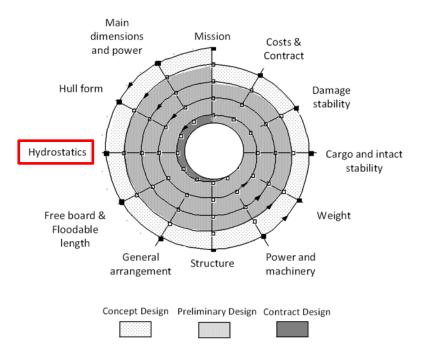
Traditional versus CAD systems





Hull forms and hydrostatics

- What is hydrostatics and why they are important in ship design?
- Numerical Integration methods !
- Explain and apply basic hydrostatic formulas and methods (Simpson's 1st Rule)







Thank you !