Sveučilište u Rijeci • University of Rijeka
Trg braće Mažuranića 10 • 51 000 Rijeka • Croatia
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3.2. Course description

Generic information		
Head of Course	Igor Rudan, PhD	
Course	Ship design and construction 2	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Undergraduate degree programme	
Type of Course	Mandatory	
Year of Study	1st	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30 + 30 + 0 (2 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to acquaint students with the basic characteristics of ship stability and the division of stability according to different criteria. In addition to numerical tasks, students should correctly interpret the criteria of initial transverse stability and transverse stability at higher tilt angles and longitudinal stability of the ship. Detailed introduction and analysis of transverse and longitudinal stability due to vertical and horizontal displacements of masses and transhipment. A thorough introduction and interpretation of the dynamic stability of the ship and the influence of the dimensions and technology of the ship on stability.

1.2. Prerequisites for Course Registration

No prerequisites

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Describe and interpret the ship stability according to different criteria
2. Analyse and parse initial stability with basic elements of transverse statical stability
3. Analyse and calculate the effect of different mass shifting on the transverse stability of the ship
4. Analyse and calculate the elements of transverse statical stability in mass transshipment (loading/unloading)
5. Interpret and evaluate the effects of Free Surfaces Correction on ship stability
6. Analyse and parse the longitudinal ship stability
7. Analyse and calculate the effect of different mass shifting on the longitudinal stability elements of the ship
8. Analyse and calculate the effect of transshipment (loading / unloading) on the elements of longitudinal stability of the ship
9. Explain the basic concepts of dynamic ship stability

1.4. Course Outline

Ship stability definition and division. Basic ship hydrostatics. Statical initial transverse metacentric high. Transverse statical stability change in vertical and horizontal mass shifting. Transverse statical stability change in mass transshipment (loading/unloading). Transverse statical stability change in hanging loads. Influence of *Free Surface Correction* (FSC) on transverse statical stability. Statical transverse stability at large angles of heel. *GZ curve* construction with Intact stability regulations analyses. *KG* calculation in transverse

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Ship stability definition and division. Basic ship hydrostatics. Statical initial transverse metacentric high. Transverse statical stability change in vertical and horizontal mass shifting. Transverse statical stability change in mass transshipment (loading/unloading). Transverse statical stability change in hanging loads. Influence of *Free Surface Correction* (FSC) on transverse statical stability. Statical transverse stability at large angles of heel. *GZ curve* construction with Intact stability regulations analyses. *KG* calculation in transverse stability. Statical longitudinal stability. Longitudinal stability change in mass shifting or mass transshipment (loading/unloading). *XG* calculation in longitudinal stability. Dynamical stability analyses. Damage stability. Ship's trim and stability book.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Active attendance of classes over 70 %. Longitudinal and transversal ship drawing – student task. Passed two written exams. Final oral exams.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

70 % of the course grade is based through 2 written exams in class and 30 % of the course grade is based in the oral final exam according to the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka.

Continuous assessment: Each written exam must have at least 70 % score.
Final exam:

- Written (numerical) exam – ship transfers/longitudinal stability, loading / unloading / shifting of cargo, … - student must have 100 % score, and then
- oral exam (learning outcomes 1- 9) checks the competences of theoretical knowledge where it is necessary to achieve a minimum of 50 % of the required theoretical knowledge.

1.10. Main Reading

1. Rudan, I., teaching materials from the course Ship design and construction on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka (webinars, PPT, theory self-evaluation tests, practical (numerical) self-evaluation tests, …)
2. Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2002.
3. Ocean Learning Platform - training solutions
4. Buljan, I., Stabilnost broda, Priručnik za pomorce, Školska knjiga Zagreb, Zagreb, 1982.
5. Uršić, J., Stabilitet broda I. dio, Sveučilište u Zagrebu, Zagreb, 1968.
6. Uršić, J., Stabilitet broda II. dio, Sveučilište u Zagrebu, Zagreb, 1968.

1.11. Recommended Reading

[1] NOTE: Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1. Dokkum, K., Katen, H.T., Koomen K., Pinkster J., Ship Stability, London, 2001.
2. Derrett, D.R., Ship stability – for Masters and Mates, Butterworth Heinemann, Woburn, 2001.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials from the course Ship design and construction	MERLIN – online	
Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2002.	10	
Ocean Learning Platform - training solutions	10	
Buljan, I., Stabilnost broda, Priručnik za pomorce, Školska knjiga Zagreb, Zagreb, 1982.	10	
Uršić, J., Stabilitet broda I. dio, Sveučilište u Zagrebu, Zagreb, 1968.	10	
Uršić, J., Stabilitet broda II. dio, Sveučilište u Zagrebu, Zagreb, 1968.	10	

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, exam passing results are analysed and appropriate measures are adopted.