Linnæus University

Jnr: 2014/4156-3.1.2

Course syllabus

Faculty of Technology
Kalmar Maritime Academy

1FT52I Fartygs miljöpåverkan, 8 högskolepoäng
Ship Environmental Impact, 8 credits

STCW reference
Sektion A-III/2

Subject Group
Other Subjects within Technology

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by Faculty of Technology 2015-01-13
The course syllabus is valid from autumn semester 2015

Prerequisites
General entry requirements and Mathematics 2a / 2b / 2c, Physics 1b1 / 1a or Mathematics B, Physics A (Field-specific entry requirements 7/A7). Program course Ship Machinery Management 5 credits, or similar.

Objectives

Proficiency and comprehension
By the end of this course, students will be able to:

- provide an in-depth account of the main environmental problems in marine environments
- account for the advantages and disadvantages of different operating techniques to reduce the vessel's harmful emissions into air and water
- compare the environmental impacts of different types of vessels
- describe the basic propeller theory
- describe different propulsion options
- explain how various operating conditions influence the propulsion load curve
- describe the EEDI, EEOI and SEEMP

Skills and abilities
By the end of this course, students will be able to:

- orally and in writing summarize information from scientific reports and articles concerning ship propulsion and environmental impact
- describe the different types of ship propulsion resistance and its varying importance for different types of vessels
- perform basic calculations to assess that the impact on fuel consumption is

- perform basic calculations to assess that the impact on fuel consumption is influenced by a momentum change for different types of vessels

Evaluation skills and Approach
By the end of this course, students will be able to:

- orally and in writing reflect upon technological development, economic instruments and attitudes that affect ship emissions to air and water

Content

- Environmental problems in marine environments
- Environmental impacts of ship emissions to air and water
- Quantification of emission quantities at different operating conditions
- Optimization of ship operation to reduce emissions to air and water
- Ship propulsion resistance
- Froude number
- Basic computational model for the relationship between speed, power and fuel consumption
- Basic propeller theory
- Different types of propellers and propulsion options
- Diesel engine load characteristic of load curves for different operating conditions
- Applicable international maritime resolutions
- EEDI Energy Efficiency Design Index
- EEOI Energy Efficiency Operational Index
- SEEMP Ship Energy Efficiency Management Plan

Type of Instruction
Instruction consists of lectures and exercises

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
The expected objectives must be achieved in order to pass the course. In order to receive the grade, Pass, the objectives must be met. In order to receive the Pass with distinction grade, a similar grade is required for the written exam.
Knowledge assessment takes place as follows:

- The individual written examination and graded exercises

Course Evaluation
Course evaluation is in accordance with the Kalmar Maritime Academy's quality manual.

Required Reading and Additional Study Material

Scientific papers and reports, and textual material from various national and websites of international agencies and organizations (approx. 200 pages)

Kees Kuiken, *Diesel Engines II*, latest eidtion