

ANNOTATION

Ship Diesel Engines 75 hours, mandatory	ESTC credits: 5
Department: Ship Power Systems	Lectures: Assoc. Prof . Ph.D. Ivan Ivanov Exercises: Assoc. Prof . Ph.D. Ivan Ivanov Assist. Prof . Ph.D. Dragiya Yanulov
<p>Learning objectives:</p> <p>Students SHOULD KNOW:</p> <ul style="list-style-type: none"> - operational principles and basic characteristics of working processes; - design features, operational conditions, materials, maintenance and service of fixed and running parts of marine diesel engines; - dynamics and balance of the engine; - operational principles, design, service and maintenance of gas exchange control devices; - operational principles, design, service and maintenance of engine service systems; - theoretical basics of turbocharged diesel engines operation; - design features of modern marine diesel engines, service systems and equipment and rules for their operation; - basic mathematical models of working processes and their application in engine simulators, diagnostics and modern control systems; - basics of components interaction in turbocharged marine diesel engines; - performance characteristics and optimal operational mode selection; - methods for engine performance improvement; - methods and means for environmental protection; <p>Students SHOULD BE ABLE TO:</p> <ul style="list-style-type: none"> - navigate through the extraordinary diversity of marine diesel engine constructions and modifications; - prepare for operation, start and service diesel engines in laboratory conditions; - carry out equipment adjustments; - service the engines and equipment in the laboratory; - define the load diagram and performance curves of marine diesel engine; - prepare and present reports which include measurements data, calculated data and explanatory notes; - conduct software aided control and monitoring of marine engines. 	
<p>Assessment System:</p> <p>The trainees' progress in the acquisition of the material is controlled at the end of each topic. The theoretical knowledge of the trainees is assessed with questionnaires and tests. Their practical knowledge is assessed by the instructor with reports and oral assignments.</p> <p><i>(Only students who have done and passed the semester tests and tasks successfully are allowed to sit for the examinations.)</i></p>	

Contents:			
No.	Subject Area (modules)	Lectures	Exercises
1.	Thermodynamic method	4	-
2.	Precise method of Grinevetsky	5	-
3.	Working cycle characteristics	3	1
4.	Fuel injection in diesel engines.	2	-
5.	Fuel/air mixing and combustion.	4	-
6.	Scavenging of two-stroke marine diesel engines	2	-
7.	Supercharging of marine diesel engines.	4	-
8.	Mathematical modelling of marine diesel engines	2	-
9.	Characteristics of marine diesel engines.	4	2
10.	Service and maintenance basics	2	2
11.	Internal combustion engines classification. Basic definitions. Operating principles and basic performance characteristics of marine diesel engines.	4	-
12.	Design of marine diesel engines. Major fixed and running parts of marine diesel engines.	6	-
13.	Dynamics and balance of internal combustion engines	4	-
14.	Gas exchange control devices	2	2
15.	Marine diesel engines service systems	10	4
16.	Design of modern marine diesel engines	2	4
	Total	60	15