GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Bachelor of Science	Branch/Spec.	Nautical Science
Semester	VI	Version	1.0.0.0
Effective from Academic Year	2021-22	Effective for the batch Admitted in	Oct 2020
Subject code	2NS601C	Gas Tanker Operations	

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	4	0	0	0	4	Theory	40	60	100
Hours	4	0	0	0	4	Practical	0	0	0

Pre-requisites:

Objectives of the Course:

After successful completion of this course student will be able to remember, understand Gas Tanker operations.

Theory Syllabus

Unit	Content	Hrs
1.	**Introduction**. Design and characteristics of a liquefied gas tanker. Knowledge of liquefied gas tanker design, systems, and equipment, including: 1) Types of liquefied gas tankers and cargo tanks construction 2) General arrangement and construction 3) Cargo containment systems, including materials of construction and insulation.	**10**
2.	**Hazards**. Knowledge and understanding of the hazards and control measures associated with liquefied gas tanker cargo operations, including: 1) Flammability 2) Explosion 3) Toxicity 4) Reactivity 5) Corrosivity 6) Health Hazards 7) Inert Gas Composition 8) Electrostatic Hazards 9) Polymerizing Cargoes)	**10**
3.	**Operations:** Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation Loading, unloading, care and handling of cargo Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity. Proficiency in tanker safety culture and implementation of safety management requirements. Proficiency to apply safe preparations, procedures and checklists for all cargo operations, including: 1) Post docking and loading: a) Tank inspection b) Inerting (Oxygen reduction, dew point reduction) c) Gassing-up d) Cooling down e) Loading f) De-ballasting g) Sampling, including closed-loop sampling 2) Sea passage: a) Cooling down b) Pressure maintenance c) Boil-off d) Inhibiting 3) Unloading: a) Unloading b) Ballasting c) Stripping and cleaning systems d) Systems to make the tank liquid-free 4) Pre-docking preparation: COPYRIGHT OF MANET 248 a) Warm-up b) Inerting c) Gas-freeing d) Ship-to-ship transfer Proficiency to perform cargo measurements and calculations, including: 1) Liquid phase 2) Gas phase 3) On Board Quantity (OBQ) 4) Remain On Board (ROB) 5) Boil-off cargo calculations	**16**
4.	**Safety** Apply occupational health and safety precautions. Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to liquefied gas tankers, including: 1) Precautions to be taken when entering	**10**

	enclosed spaces (such as compressor rooms), including the correct use of different types of breathing apparatus 2) Precautions to be taken before and during repair and maintenance work, including work affecting pumping, piping, electrical and control systems 3) Precautions for hot and cold work 4) Precautions for electrical safety 5) Use of appropriate Personal Protective equipment (PPE) 6) Precautions for cold burn and frostbite 7) Proper use of personal toxicity monitoring equipment	
5.	**Emergencies** Respond to emergencies. Knowledge and understanding of liquefied gas tanker emergency procedures, including: 1) Ship emergency response plans 2) Cargo operations emergency shutdown procedure 3) Emergency cargo valve operations 4) Actions to be taken in the event of failure of systems or services essential to cargo operations 5) Fire-fighting on liquefied gas tankers 6) Jettisoning of cargo 7) Enclosed space rescue. Dangerous Goods (MFAG)	**8**
	TOTAL	**54**

Practical Content:

Text Books:

Reference Books

ICT/MOOCs Reference

Course Outcomes:

COs	Description
CO1	Safe cargo operation of a liquefied gas tanker.
CO2	Precautions to prevent hazards.
CO3	Occupational health and safety precautions and measures.
CO4	Pollution prevention of the environment from the release of liquefied gas.

Mapping of CO and PO:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	1	2	1	3	1	1	2	1	3
CO2	3	2	0	1	0	1	0	1	1	2	1	0
CO3	3	0	1	0	3	1	3	0	2	0	1	3
CO4	3	2	0	1	0	1	0	1	2	2	1	0