Heat Transfer

Basic Course Specification		
Course Title	**Course Code**	**Program on which the course is given**
Heat Transfer	ME331T	Bachelor
Academic Year	**Specialization** (hr/week)	**Pre-Requisites**
2020 - 2021	• Theoretical (2) • Application (2) • Credit (3Cr.)	ME231T

Overall Course Objectives

This course provides the general principles of heat transfer method, processes, heat exchangers design. This syllabus covers the requirements of the STCW-78, as amended. In particular Chapter III, Section A-III/2 for the function "Marine Engineering at the Management Level", STCW-78, as amended. The syllabus is so designed with the guide of IMO Model course 7.02, version 2014, function 1. Operation, surveillance, performance assessment and maintaining safety of propulsion plant and auxiliary machinery practical knowledge.

Course Learning Outcomes. By successful completion of the course each student will be able to:

Topic	Linking to PLOs	7th Week	12th Week Assessment	Class Activities	Final Exam
1) analyze basic principles for conduction heat transfer	**A,c**	x	**x**	**x**	**X**
2) Apply the principles of conduction, convention and radiation mode of heat transfer to solve heat transfer problems.	**C,e, f**	x	x	**x**	**x**
3) Design a heat exchanger through analysis of the thermal performance of heat exchangers and recognize and evaluate the conflicting requirements of heat transfer optimization and pressure drop minimization.	**D,e, k**			**x**	**x**

Course Content

Lec./ Week #	Topic	Hrs. #	Theoretical	Application
1	-Review of heat transfer	4	2	2
2	-Steady state conduction one dimension	4	2	2
3	-General conduction equations – External surfaces	4	2	2
4	- General conduction equations – External surface	4	2	2
5	-Steady state conduction two dimensions	4	2	2
6	- Steady state conduction two dimensions -Principles of convections	4	2	2
7	- Principles of convections	**4**	**2**	**2**

Course Content				
Lec./ Week #	**Topic**	**Hrs. #**	**Theoretical**	**Application**
	7th Week Exam			
8	Principles of convections Empirical relations for forced convections	4	2	2
9	Empirical relations for forced convections	4	2	2
10	Empirical relations for forced convections	4	2	2
11	Empirical relations for forced convections	4	2	2
12	Natural convection systems.	**4**	**2**	**2**
13	Natural convection systems.	4	2	2
14	Radiation heat transfer.	4	2	2
15	Radiation heat transfer.	4	2	2
16	**Final Assessment**			
Total Hours		**60**	**30**	**30**

Teaching & Learning Methods	Facilities Required for Teaching & Learning Methods
• Lectures • Tutorials • Assignments & sheets	• White board and data show • Power Point Presentation

Students Assessment Methods	
Assessment Schedule	
Assessment#1	Week 7
Assessment#2	Week 12
Assessment#3	Class Activities
Assessment#4	Week 16

Grading Method		
7th Week Assessment	Written Exam	**30%**
12th week Assessment	Written Exam	**20%**
Class Activities	Assignments – Quizzes - Tutorials	**10%**
Final Exam	Written Exam	**40%**
	Total	**100 %**

Staff Requirements
Marine Chief Engineer/ Ph.D.

List of References	
Course Notes	**Essential Books**
Lecturer notes and sheets	HOLMAN, J., "HEAT TRANSFER, 9780071267694" McGRAW-HILL 10ED, 2010".
Recommended Books	**Periodicals and Publications**
None	None

IMO References
None

Accreditation Bodies
*Egyptian Authority for Maritime Safety (EAMS)
*European Commission (EC)
*ISO (9001 – 2015) DNV-GL
*Central Evaluation and Accreditation Agency Hanover, Germany (ZEVA)
*Ministry of Education (KSA)
*Ministry of Higher Education (Greece)
*Ministry of Higher Education (Oman)
*Commission for Academic Accreditation (CAA), Ministry of higher Education (UAE)
*University of Plymouth, United Kingdom (dual degree)

Prepared by: Course Coordinator **Reviewed by: Head of Department**

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