

Liverpool John Moores University

Title: HUMAN FACTORS IN DESIGN AND OPERATIONS
Status: Definitive
Code: **7513RSKDL** (118771)
Version Start Date: 01-08-2019

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
Zaili Yang	Y

Academic Level: FHEQ7
Credit Value: 10
Total Delivered Hours: 16.5
Total Learning Hours: 100
Private Study: 83.5

Delivery Options

Course typically offered: Runs Twice - S1 & S2

Component	Contact Hours
Lecture	8
Online	.5
Tutorial	8

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	Essay		95	
Reflection	Test&refl		5	

Aims

To understand the scope and objectives of Human Factors and be able to justify the need for its appropriate consideration in risk assessment and control.

To explain why humans make mistakes and what tools are available to identify and analyze human errors and the conditions and situations that cause them.

To highlight how best to enhance process design, working environment and procedures, to support and improve human performance.

Learning Outcomes

After completing the module the student should be able to:

- 1 Justify the application of human factors to the design and assessment of tasks, equipment, systems and processes.
- 2 Compare and contrast the different types of human error and violations, and devise appropriate strategies for prevention/reduction.
- 3 Critically review the tools and techniques available to support human error identification and quantification
- 4 Illustrate and interpret models of accident causation, relating them to actual industrial accidents and strategies for improving safety
- 5 Consider to what extent HF can be or has been successfully applied to a project, facility or organisation.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Essay	1	3	4	5
Online test & Reflection	2			

Outline Syllabus

1. Introduction to Human Factors

- What? Defining Human Factors*
- How? Overview of things to consider*
- When? Integrating into the system lifecycle*
- Why? Benefits of Human Factors*

2. Human Factors in Design

- How an understanding of human abilities, limitations and needs, can be applied to the design and assessment of tasks, equipment, systems and processes*
- What effective HF in Design looks like*
- How it can reduce human error, improve safety and increase efficiency*

3. Information Processing and Operations

- How humans perceive, process and act on information*
- Determining user information needs to ensure safe and effective performance of required tasks – information use and misuse*
- System design considerations in system-user information exchange*
- Different types of operating "modes" and considerations for working within teams*

4. Human Error and Reliability Analysis

- Human error theory basics*
- Error identification and accident/incident root cause analysis*
- Human reliability analysis steps and comparison of various techniques available*
- Error mitigation and reduction*

5. Human Factors Integration

□ *What HF Integration (HFI) is, why it is important and how to achieve it within a project operating facility or organisation*

□ *The basic steps to the HFI process*

□ *What and when HF activities need to occur throughout the system lifecycle*

□ *Review of Key Learning Points*

□ *Bibliography, sources of further study*

□ *Module conclusions and close out*

Learning Activities

A combination of slides and notes, exercises, discussions, interactive web activities and supported self study.

Notes

The purpose of this module is to explain how an understanding of human abilities, limitations and needs, can be applied to the design and assessment of tasks, equipment, systems and processes, in order to reduce human error, improve safety and increase efficiency. It also aims to highlight how and why human errors occur, and to describe the methods, tools and techniques that can be used to identify, analyse and reduce them. This includes definitions, physical ergonomics, cognitive ergonomics, safety and human reliability and human factors integration.

The assessment for this module is an essay combined with online activities (e.g. tests, discussions, etc.).