Liverpool John Moores University

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Title:	Engineered Risk Control Systems & Performance (Nuclear)
Status:	Definitive
Code:	**7531ENGRSK** (118601)
Version Start Date:	01-08-2011
Owning School/Faculty:	Technology & Environment
Teaching School/Faculty:	Risktec Solutions

Team	Leader
Alan Wall	

Academic Level:	FHEQ7	**Credit Value:**	10.00	**Total Delivered Hours:**	16.50
Total Learning Hours:	100	**Private Study:**	83		

Delivery Options
Course typically offered: Runs Twice - S1 & S2

Component	Contact Hours
Lecture	10.000
Online	0.500
Tutorial	6.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	case study	An essay question comprising several component parts, based around a case study, up to 2,000	50.0	
Technology	analysis	Analyse plant to deduce the Safety Critical Elements and devise performance standards, up to 2,000 words.	50.0	

Aims

To provide an understanding of Engineered Safety Systems and the need for

Performance Standards and Technical Integrity Verification Schemes over the lifecycle of the plant.

Learning Outcomes

After completing the module the student should be able to:

LO1	Critically review the application of engineered risk control systems in the Nuclear industry;
LO2	Analyse a nuclear plant to logically deduce the relevant engineered safeguard systems
LO3	Devise Performance Standards for nuclear safeguards
LO4	Illustrate how the engineered control systems studied contribute to maintenance of technical integrity over the lifetime of the nuclear plant.

Learning Outcomes of Assessments

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

case study	LO 1	LO 4
performance standards	LO 2	LO 3

Outline Syllabus

Definition of an Engineered Safeguard System and the need for Performance Standards with an emphasis on practices employed within the Nuclear Industry
** Examples of Engineered Safeguard Systems*
** Defining Performance Standards*
** Functional requirements*
** Availability & Reliability (more detail in Availability, Reliability, Maintainability (ARM) Analysis*
** Survivability*
** Interdependencies*
** Performance Assurance*
** Verification of Performance*
** Technical Integrity assurance throughout an assets lifecycle*
** Codes and standards*
** Material selection*
** Design reviews*
** Fabrication tests, certification etc.*
** Construction reviews and inspections*
** Commissioning tests*
** Preventative maintenance systems*

Learning Activities

A combination of lectures, exercises during the taught session, and supported self study.

References

Course Material	Website
Author	ENERGY INSTITUTE
Publishing Year	2007
Title	Guidelines for the management of safety critical elements
Subtitle	http://www.energyinstpubs.org.uk/pdfs/694.pdf
Edition	2nd Edition
Publisher	
ISBN	

Course Material	Website
Author	IAEA
Publishing Year	
Title	IAEA Fundamental Safety Principals (No. SF-1)
Subtitle	http://www-pub.iaea.org/MTCD/publications/PDF/Pub1273_web.pdf
Edition	
Publisher	
ISBN	

Course Material	Website
Author	IAEA
Publishing Year	
Title	IAEA Safety of Nuclear Power Plants: Design (No. NS-R-1)
Subtitle	http://www-pub.iaea.org/MTCD/publications/PDF/Pub1099_scr.pdf
Edition	
Publisher	
ISBN	

Course Material	Reports
Author	IAEA
Publishing Year	
Title	Safety Classification of Structures, Systems and Components in Nuclear Power Plants (DS367 Draft)
Subtitle	
Edition	
Publisher	
ISBN	

Notes

The aim of this module is to provide an understanding of Engineered Safeguard Systems and the need for Performance Standards and Technical Integrity Verification Schemes with a particular emphasis on the Nuclear Industry.
The assessment for this module is a combination of essay and technological task.