Liverpool John Moores University

Title:	Materials and Testing
Status:	Definitive
Code:	**7005ENGEAT** (117606)
Version Start Date:	01-08-2016
Owning School/Faculty:	Maritime and Mechanical Engineering
Teaching School/Faculty:	Maritime and Mechanical Engineering

Team	Leader
Ian Jenkinson	Y
Christian Matthews	

Academic Level:	FHEQ7	**Credit Value:**	10	**Total Delivered Hours:**	18
Total Learning Hours:	100	**Private Study:**	82		

Delivery Options
Course typically offered: Non Standard Year Long

Component	Contact Hours
Lecture	12
Practical	6

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	Essay		50	
Test	Test		25	
Test	Test		25	

Aims

This module aims to provide students with advanced coverage of the materials science which is related to the construction and maintenance of assets in electrical power distribution networks and to familiarize students with standard testing practices.

Learning Outcomes

After completing the module the student should be able to:

1 Analyse the mechanisms which lead to corrosion and degradation of materials and components.
2 Analyse the common mechanisms which cause mechanical failures.
3 Select and apply appropriate methods for testing the mechanical properties of materials.
4 Select and apply methods for testing the electrical properties of materials

Learning Outcomes of Assessments

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

Coursework 1	1	2
Lab 1 Mechanical Testing	3	
Lab 2 Electrical Testing	4	

Outline Syllabus

Fundamental mechanics of materials – Stress, Strain, Poisson's Ratio, Yield Strength, Ultimate Tensile Strength, Factors of Safety.

Testing the mechanical properties of materials – tensile strength, stiffness, fatigue life, hardness.

Testing the electrical properties of materials – Conductivity, Dielectrics, partial discharge

Corrosion and Degradation – Deterioration mechanisms. Chemical corrosion, Electrochemical corrosion.

Failure – Modes and mechanisms of failure, including Fracture, Fatigue and Creep.

Learning Activities

Lectures, laboratory sessions and private study

Notes

This module is block delivered

The teaching and learning activities in this module will be supported by the research activities of Professor James Ren and Dr Gareth Bradley of the LJMU Research Center for Design, Mechanics and Materials.