

# **EAS421 Degradation and Protection for Aerospace**

**Level:** 4

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JAN

## **Synopsis:**

The course introduces the various forms and mechanisms of corrosion and degradation of metals and alloys as well as the measures that improve durability and stability in these respects. In the second part, an insight into the operation and capabilities of surface engineering techniques and their effects on the coated and treated surface they can be used to produce is revealed.

## **Topics:**

- Over-view of electrochemical nature of corrosion of metals, standard electrode potentials and kinetics.
- Definition of polarisation and investigation of corrosion properties.
- Forms of corrosion and the different methods of corrosion control.
- Consideration of the mechanical and chemical properties that can be influenced and controlled by surface engineering techniques, their respective capabilities and the properties of the coated or treated surface that they can be used to produce.

## **Textbooks:**

Pierre R. Roberge: Corrosion Engineering: Principles and Practice McGraw-Hill  
ISBN-13: 9780071482431-AA

Pierre R. Roberge: Corrosion Engineering: Principles and Practice McGraw-Hill  
ISBN-13: 9780071482431

**Learning Outcome:**

- Explain the electrochemical nature of the corrosion of metals as applied to their uses in aerospace vehicles.
- Use the characteristics of standard electrode potentials and kinetics in the evaluation of the corrosion of aircraft structures.
- Explain the term polarization and use corrosion properties to investigate the state of corrosion in given aircraft structural case studies.
- Differentiate the different forms of corrosion found in the periodic inspection of aircraft structures.
- Explain in detail, the use of different corrosion control methods given specific aircraft structural corrosion case studies.
- Discuss the use of coated/treated surfaces to alter the mechanical and chemical properties of aircraft materials in surface engineering techniques case studies.

**Assessment Strategies:**

<b>Continuous Assessment Component</b>	<b>Weightage (%)</b>
QUIZ	15
LAB REPORT	15
<b>Sub-Total</b>	<b>30</b>

<b>Examinable Component</b>	<b>Weightage (%)</b>
Written Exam	70
<b>Sub-Total</b>	<b>70</b>

**Weightage Total** **100**