

Reliability and safety

Lecturer

Pierre-Etienne LABEAU (Coordinator)

Course mnemonic

PHYS-H514

ECTS credits

3 credits

Language(s) of instruction

English

Course period

First term

Campus

Solbosch

Course content

Relevance of RAMS (Reliability, Availability, Maintainability and Safety) studies. Basic concepts. Operational feedback in RAMS. Modelling of one component – elements of renewal theory. Boolean qualitative and quantitative analysis methods for multi-component systems (reliability block diagrams, fault trees, event trees). Markovian reliability and modelling of functional dependencies. RAMS modelling based on Petri nets and Monte Carlo simulation. Maintenance policies.

Objectives (and/or specific learning outcomes)

This course treats the issues of safety and performances of industrial systems subject to failures. It provides an overview of the main methodologies used in RAMS (Reliability, Availability, Maintainability and Safety) assessments.

Teaching method and learning activities

Oral lectures with many exercises and tutorials, some of which on commercial software.

Lectures are also available online, given the sanitary situation.

References, bibliography and recommended reading

A.Pagès & M. Gondran, "Fiabilité des Systèmes", Eyrolles, Paris, 1980. H. Kumamoto & E.J. Henley, « Probabilistic Risk Assessment

and Management for Engineers and Scientists », 2nd edition, IEEE Press, New York, 1996. M. Modarres, "What Every Engineer Should Know about Reliability and Risk Analysis", Marcel Dekker Inc., New York, 1993. A. Lannoy, "Analyse Quantitative et Utilité du Retour d'Expérience pour la Maintenance des Matériels et de la Sécurité », Eyrolles, Paris, 1996. A. Dubi, « Monte Carlo Applications in System Engineering », John Wiley & Sons, Chichester, 1999. J. Libmann, "Eléments de Sûreté Nucléaire", IPSN, Les Editions de Physique, 1996. T. Bedford & R. Cooke, « Probabilistic Risk Analysis – Foundations and Methods », Cambridge University Press, 2001.

Other information

Place(s) of teaching

Solbosch

Contact(s)

Métrologie nucléaire Bât D, Porte B, Niv 3, local 153 Tél : 02/650 20 60 - Mail : pierre.etienne.labeau@ulb.be

Evaluation method(s)

Other

Evaluation method(s) (additional information)

Written exam (open-book format) on theory and exercises

Determination of the mark (including the weighting of partial marks)

Written exam (100%)

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IREM | Master of science in Electromechanical Engineering | finalité Professional/unit 2 and MA-IRPH | Master of science in Physical Engineering | finalité Professional/unit 1