

NOC: Risk and Reliability of offshore structures - Video course

COURSE OUTLINE

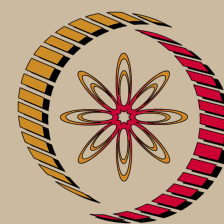
Considering the importance of offshore structures, one has to recognize that there are other intrinsic uncertainties such as material properties, analysis methods, design procedures etc, which are addressed rationally. A detailed knowledge of reliability of offshore structures using probabilistic tools becomes need of the hour for both industry and academia. Offshore activities, on one hand, lead to increase in societal wealth, and, on the other hand, make society vulnerable to risks. An offshore engineer is usually accountable for the decisions that he takes. A hallmark of professionalism is to quantify the risks and benefits involved. The present course aims to introduce the basics of the structural reliability analysis procedures. The Registrants would benefit from the course by learning the basics of reliability-based design and principles underlying code calibration, which would provide the groundwork to embark upon research in this field. Key focus will be on safety and reliability issues of offshore facilities during analysis and design, inspection and planning.

COURSE DETAIL

ModuleNo.	Topics
1.	Concepts of probability Sampling statistics Types of uncertainties Modeling random variables like loads, material properties etc Introduction to classical reliability theories Error estimation
2.	Levels of reliability Reliability estimates FOSM, AFOSM and application problems Codes of practice of safety check Reliability bounds of structural systems Treatment of geometric variables Probabilistic methods of code calibrations
3.	Application to offshore structures Stochastic process Gaussian process Risk assessment Hazard identification ETA, FTA Risk modeling and Risk picture Probabilistic risk assessment

References:

a) Text books:



NP-TEL

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**Ocean
Engineering**

Pre-requisites:

UG/PG/Ph.D of all engg branches and PG of applied sciences; Diploma students can also register

Coordinators:

**Dr. Srinivasan
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3. Chakrabarti, S.K. 1994. Offshore Structure Modeling: World Scientific, Singapore.
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Research articles

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3. Bobbio A, Portinale L, Minichino M, Ciancamerla E. Improving the analysis of dependable systems by mapping fault trees into
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6. Breitung, K., "Asymptotic Approximation for Multi-normal Integrals", Journal of Engineering Mechanics Division, ASCE, 110(3), PP. 357-366, 1984
7. Cooper GF, Herskovits E. A Bayesian method for the induction of probabilistic networks from data. Mach Learn 1992;9(4):309-47.
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11. Dahll G, Gran BA. The use of Bayesian belief nets in safety assessment of software based systems. Special Issues Int J Intelligent Inf Syst 2000;24(2): 205-29.
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