

About The Course

The course duration is 2 days and will consist of both theoretical and practical applications of risk and reliability engineering. The course will introduce the fundamentals of Risk analysis and reliability engineering. Reliability, availability and maintainability (RAM) Analysis will be dealt with. Quantity risk analysis, basic statistics, distribution of failure, reliability of failure, consequences of failure and monte-carlo simulations (MCS).

On successful completion of this course, you will be able to: 1) identify and analyse the concepts and principals of risk and reliability engineering and their potential applications to different engineering problems. 2) Assess and analyse appropriate approaches to the collection and interpretation of data in the application of risk and reliability engineering methods. 3) Evaluate and select appropriate techniques and tools for qualitative and quantitative risk analysis and reliability assessment. 4) Analyse and evaluate failure distributions, failure likelihood and potential consequences and develop solutions for control/mitigation of risks.

Why should we do a risk and reliability analysis?

- Enable good decision making in the presence of uncertainty.
- Demonstrate that all risks are identified and appropriately mitigated or reduced (ALARP)
- Moral- risk of death or serious injury (Safety)
- Legal- comply with regulators. (UK-Health and Safety Executive)
- Economic- profit, return for investors/ Shareholders.

Who Should Attend?

This training is suitable for mechanical, process, energy engineers and professionals that want to obtain knowledge on applied aspects of risk and reliability engineering.

Cost

The registration fee of the workshop will be £695 + VAT (UK only) which includes course notes and lunches. You should make your own arrangements for accommodation.

Payment

Payments can be made by cheque (made payable to ASRANet Ltd.), cash or bank transfer. Please enquire for details.

Venue : Aberdeen Venue (to be confirmed)

Note; Please do not make your travel arrangements until you receive an Invoice from us.

Contact

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ONLINE COURSE (VIA ZOOM) and ON-SITE Risk Analysis & Reliability Engineering

13th-14th June 2022

Aberdeen



(A Maritime Company for Courses, Conferences and Research)

PROGRAMME (All timings are in BST(GMT+1))

Monday 13th June 2022

09.00 – 10.30 **Lecture 1: Introduction:**
Basic concept of Safety and Risk Analysis. Definition of Reliability, Maintainability, Availability and Resilience. Qualitative and Quantitative Risk Assessment. Risk based decision making.
Dr Peter Dunning

10.30 – 10.45 *Break*

10.45 – 12.15 **Lecture 2: Statistical analysis**
Statistical analysis: Interpretation of statistical output and data visualization; Introduction to regression modelling techniques.
Dr Srinivas Sriramula

12.15 – 13.15 *Break*

13.15 – 14.45 **Lecture 3: Risk analysis methods**
Failure Mode & Effects Analysis (FMEA) and its extension to include criticality (FMECA) for risk prioritisation.
Event and fault tree methods for risk analysis of complex systems.
Dr Peter Dunning

14.45 – 15.00 *Break*

15.00 – 16.30 **Lecture 4: Data analysis and Distribution fitting**
Hypothesis testing; goodness of fit distribution tests.
Dr Srinivas Sriramula

Tuesday 14th June 2022

09:00– 10.30 **Lecture 5: RAMs analysis**
Reliability block diagrams. Reliability, Availability and Maintainability (RAM) analysis of components and systems.
Dr Peter Dunning

10:30-10:45 *Break*

10.45– 12.15 **Lecture 6: HAZOP and Functional Safety**
Hazard and operability study analysis (HAZOP); elements of functional safety analysis
Dr Srinivas Sriramula

12.15 – 13.15 *Break*

13.15 – 14.45 **Lecture 7: Safety integrity levels – assessment and verification**
SIL fundamentals, target risk levels, SIL assessment, Markov processes: basic elements
Dr Srinivas Sriramula

14.45 – 15.00 *Break*

15.00 – 16.30 **Lecture 8: Efficient Monte Carlo simulation methods**
Advantages and limitation of Monte Carlo methods. Advanced Monte Carlo methods for reliability analysis. Important sampling, Line Sampling and Subset Simulation.
Dr Peter Dunning

ABOUT THE LECTURERS:

Dr Srinivas Sriramula

Dr Srinivas Sriramula is currently a Senior Lecturer at the University of Aberdeen. Dr Sriramula specialises in technical safety computations and has over 15 years research experience in developing uncertainty quantification schemes for engineering systems. To date he has participated in a number of collaborative research projects on asset risk, reliability and maintenance modelling, funded by InnovateUK, International Government agencies, Industrial partners, and the Lloyd's Register Foundation (LRF).

Dr Sriramula is a Chartered Engineer (IMechE) and currently coordinates the MSc in Safety and Reliability Engineering (including for Oil&Gas), MSc Subsea Engineering and MSc Offshore Engineering at the University of Aberdeen.

Dr Peter Dunning

MEng, PhD, CEng MIMechE, FHEA, lecturer in the School of Engineering, University of Aberdeen and programme leader for Mechanical Engineering. Taught a masters level course on Engineering Risk and Reliability Analysis since 2016. Research interests include optimal design and decision making under uncertainty, combining risk and reliability analysis with optimisation methods, particularly reliability-based structural optimisation. First degree in aerospace engineering from University of Bath (2007) and has worked at Airbus UK and NASA, before joining the University of Aberdeen in 2015.