

# Reliability Academy

## Workshop: Reliability Engineering Basics

**Date:** 2013-12  
**Venue:** Company

This 2-day course introduces common reliability engineering methods used in design and procurement of technical systems and products. The goal of the course is to give the engineers a basic understanding of the Reliability techniques, including practical tools. Exercises and team work familiarize the students with reliability terms, methods and concepts. Knowledge of the basic statistical methods will be helpful and a scientific calculator will be needed.

Day 1	Reliability Engineering Basics
8:45	<i>WELCOME and Introduction of the Course Program, + coffee/tea)</i>
9:00	<b>1. Basic Terms in Reliability Engineering</b> <ul style="list-style-type: none"> <li>- Reliability terms and concepts</li> <li>- Failure rate, MTBF</li> </ul>
10:00	<b>2. Basics of the Reliability Calculations</b> <ul style="list-style-type: none"> <li>- Reliability parameters and statistical distributions</li> </ul>
10:45	- Exercises / team work
<i>11:30-12:00</i>	<i>LUNCH</i>
12:00	- Exercises / team work
12:30	<b>3. Reliability of Systems</b> <ul style="list-style-type: none"> <li>- Series and parallel structures</li> <li>- Unrepairable and repairable systems</li> </ul>
<i>13:30-13:15</i>	<i>COFFEE/TEA</i>
13:15	- Exercises / team work
14:30	<b>4. Reliability and Risk Analysis methods</b> <ul style="list-style-type: none"> <li>- Overview of the most widely used analysis methods: FMEA, Fault Tree, Block Diagrams models etc.</li> <li>- System "bottle necks", allocation of unreliability</li> <li>- Production losses and unreliability</li> </ul>
15:45-16:00	<i>SUMMARY, discussions. End of day 1.</i>

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## ... Reliability Engineering Basics (day 2)

Day 2	..Reliability Engineering Basics
8:45	<i>INTRODUCTION to Day 2, Coffee/ Tea</i>
9:00 – 11:30	<p><b>A5. Reliability Management and timing</b></p> <ul style="list-style-type: none"> <li>- Reliability management in product development</li> <li>- Timing of the reliability engineering activities in product development</li> <li>- Reliability Program Plan, Reliability Specification</li> <li>- FRACAS – Reliability data collection</li> </ul>
	- Exercises / team work
<i>11:30-12:00</i>	<i>LUNCH</i>
12:00 – 14:00	<p><b>A6. Reliability of Electronics</b></p> <ul style="list-style-type: none"> <li>- Failure modes of electrical components</li> <li>- Parts count and MIL-217 methods: calculation of MTBF</li> <li>- Basics of Reliability Testing</li> </ul>
	- Exercises / team work
<i>14:00-14:15</i>	<i>COFFEE/ TEA</i>
	- Exercises / team work
14:15 – 16:00	<p><b>A7. Safety System Reliability – Functional Safety</b></p> <ul style="list-style-type: none"> <li>- IEC-61508 –standard: Functional Safety of the Electronic Safety Devices</li> <li>- SIL (Safety Integrity Level)</li> <li>- Failure Modes and hazardous failures, fault diagnostics</li> <li>- Improving reliability of an electronic safety device</li> </ul>
16:00-16:15	<i>CONCLUSIONS, discussion.</i>

**For more information:**

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