

**Structural Reliability**  
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**Lecture –87**  
**History Definition and Scope (Part - 05)**

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Structural Reliability  
Lecture 10  
History  
definition  
and scope

## Reliability – definition and scope

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### Reliability vs Quality

- *Quality* is a broad and in some sense a “softer” measure of a product’s value. It measures satisfaction, pleasure, desirability etc. from the use of a product.
- *Reliability* is a subset of quality that is concerned with *failure*, or more generally non-performance, in an intended function of the product. It does *not* measure how well it is fulfilling the function; reliability only cares if the function is satisfied.
- *Safety* is a subset of reliability that concerns hazards to life, health, environment and property.


### Reliability vs. Robustness vs. Resilience vs. Vulnerability

*Reliability* measures the ability to perform satisfactorily (i.e., not fail).

*Robustness* measures the ability to absorb given damage and not fail.

*Vulnerability* measures how likely a specified loss (commonly economic) is.

*Resilience* measures the ability to come back up after suffering damage.



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In this lecture we have come across terms related to reliability such as quality, robustness and so on. So, let us just take a minute to point out the differences the term quality as we understand it is a broader sense of the value of a product it measures satisfaction pleasure of use etc. Whereas reliability is a subset of quality that is concerned specifically with failure it does not measure how well it is fulfilling that function it just whether that function is being met or not.

And safety is a subset of reliability that concerns hazards to life health the environment and property. We also have used terms such as robustness. So, let us differentiate these 4 terms that we will come across during this course our reliability, robustness, resilience and vulnerability. So, as we know reliability is a measure of satisfactory performance and that measure is in terms of probability.

Robustness is a measure of the ability of the structure or the system to absorb an initial damage

and not fail. Vulnerability is more of an economic measure and resilience is a measure of the ability of a system to come back up online after suffering damage.