

# School of Mechanical Engineering

Course Code : BTME4006

Course Name: Quality and reliability engineering

UNIT 1

## Introduction to Quality

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# Outline

- What is Quality?
- History of Quality Methodology
- Deming's Principles
- Taguchi's Contributions And Philosophy
- Total Quality Management
- Quality Improvement Tools
- Costs related to quality
- Benefits/Drawbacks



What is  
Quality?



What does the word “quality” mean to you?

- Think about your past experiences staying at various hotels. Did you stay at a “quality” hotel? What about the experience made it a “quality” experience for you?
- Think about a product you bought. How can you define its “quality”?

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# Dimensions of Quality

## ❑ **Garvin (1987)**

### ❖ Performance:

✓ Will the product/service do the intended job?

### ❖ Reliability:

✓ How often does the product/service fail?

### ❖ Durability:

✓ How long does the product/service last?

### ❖ Serviceability:

✓ How easy to repair the product / to solve the problems in service?

# Dimensions of Quality

## ❖ Aesthetics:

✓ What does the product/service look/smell/sound/feel like?

## ❖ Features:

✓ What does the product do/ service give?

## ❖ Perceived Quality:

✓ What is the reputation of the company or its products/services?

## ❖ Conformance to Standards:

✓ Is the product/service made exactly as the designer/standard intended?

# Quality in different areas of society

<b>Area</b>	<b>Examples</b>
Airlines	On-time, comfortable, low-cost service
Health Care	Correct diagnosis, minimum wait time, lower cost, security
Food Services	Good product, fast delivery, good environment
Postal Services	fast delivery, correct delivery, cost containment
Academia	Proper preparation for future, on-time knowledge delivery
Consumer Products	Properly made, defect-free, cost effective
Insurance	Payoff on time, reasonable cost
Military	Rapid deployment, decreased wages, no graft
Automotive	Defect-free
Communications	Clearer, faster, cheaper service

# What is Quality?

- Conformance to specifications (British Defense Industries Quality Assurance Panel)
- Conformance to requirements (Philip Crosby)
- Fitness for purpose or use (Juran)
- A predictable degree of uniformity and dependability, at low cost and suited to the market (Edward Deming)
- Synonymous with customer needs and expectations (R J Mortiboys)
- Meeting the (stated) requirements of the customer- now and in the future (Mike Robinson)
- The total composite product and service characteristics of marketing, engineering, manufacturing and maintenance through which the product and service in use will meet the expectations by the customer (Armand Feigenbaum)



# What is Quality?

- “The degree to which a system, component, or process meets  
(1) specified requirements, and  
(2) customer or users needs or expectations” – *IEEE*
- The totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs” – ISO 8402
- Degree to which a set of inherent characteristics fulfils requirements – ISO 9000:2000

# Definitions of Quality

- **Transcendent definition:** excellence
- **Product-based definition:** quantities of product attributes
- **User-based definition:** fitness for intended use; meeting or exceeding user expectations
- **Value-based definition:** quality vs. price
- **Manufacturing-based definition:** conformance to specifications



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# More about Quality



- Realistic but demanding STANDARDS;
- Getting things RIGHT FIRST TIME; ***'It costs less to prevent a problem than it does to correct it'***
- Influences the relationship with CUSTOMERS;
- Influences how COMPLAINTS are dealt with;
- Something to do with how things LOOK and FEEL.

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# References

- Dale H. Besterfield, Carol Besterfield (2018), Total Quality Management (TQM), 5th Edition, Pearson Education, ISBN: 978-9353066314.
- Juran, J.M. and Gryna, F.M, Quality Planning & Analysis, McGraw Hill (2001).
- Grant, E.L., Statistical Quality Control, McGraw Hill (2008).
- Feignbaum, A.V., Total Quality Control, McGraw Hill (1991).
- Juran, J.M., Juran's Quality Control Handbook, McGraw Hill (1988).
- E. Balagurusamy, Reliability Engineering by Tata McGraw-Hill Publishing Company Limited, 2002.



**Thank You**

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