GAQM®
Global Association for Quality Management

Certified Product Management Specialist (CPMS)™

Course Outline

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What Modules are covered?

Module 1 - Design and Designing

1) Introduction to Design

2) Problems and Solutions

3) What is Good Design?

4) Design as Model-Making

5) Design and Needs

6) Designing as Heuristic Problem-Solving

7) Design, Creativity, Invention and Innovation

Module 2 - Models of the Design Process

1) Introduction to Models

2) Building a Simple Model of Design

3) March's Model of Design

4) BS 7000 Model of Design

5) French Model of Design

6) Pahl and Beitz's Model of Design

7) Usefulness of Design Models

Module 3 - Conceptual Design

1) Establishing the Design Space

2) Conceptual Design Case Study - Human-Powered Flight

3) The Importance of Concept

4) Concept to Prototype

5) Concept to Prototype Case Study - Jet Engine

Module 4 - Case Study in Design and Innovation

1) Concept to Prototype to Production

2) Case Study: Brompton Folding Bicycle

3) Brompton Folding Bicycle - Prototyping and Improving

4) Brompton Folding Bicycle - Production

Module 5 - Product Design Specification

1) Introduction to Product Design Specification

2) PDS Checklist

3) PDS Development

Module 6 - Product Design

1) Introduction to Product Design

2) Engineering or Industrial Design

3) 1Product Function or Form

4) Marketing the Product

5) The Fours 'Ps'

Module 7 - Introduction to Manufacturing Processes

1) Foundation

2) What is Manufacturing?

3) The Manufacturing Process

4) The Fours 'Ps'

5) Component Parts

Module 8 - Manufacturing Processes

I1) 1ntroduction to Manufacturing Processes

2) Gears and Gearing

3) Basic Manufacturing Processes

4) Scales of Material Structure

5) Product Shapes

Module 9 - Manufacturing Process - Casting

1) Introduction to Casting

2) Types of Casting

3) Liquefying the Material

4) Viscosity and Fluidity

5) Casting Metals and Plastics

6) Casting Microstructure and Defects

7) Casting the Food Mixer Gearwheel

Module 10 - Manufacturing Process - Forming

1) Introduction to Forming

2) Forces Applied during Forming

3) Working Temperatures

4) Forming Processes

5) Forming versus Casting

6) Forming the Gearwheel

Module 11 - Manufacturing Process - Cutting

1) Introduction to Cutting

2) Cutting Processes

3) Machine Cutting

4) Mechanics of Machining

5) Hardness

6) Types of Tool Material

7) Machining the Gearwheel

Module 12 - Manufacturing Process - Joining

1) Introduction to Joining

2) Mechanical Joining

3) Brazing and Soldering

4) Adhesives and Gluing

5) Welding

6) Creating the Gearwheel

Module 13 - Surface Engineering

1) Introduction to Surface Engineering

2) Stainless Steel

3) Surface Wear

4) Applying Surface Coating Material

5) Case Study: The Kitchen Knife

Module 14 - Optical Materials Engineering

1) Optical Properties of Light

2) Optical Materials Selection

3) Scratch-resistant Coatings

4) Anti-reflective Coatings

5) Optical Materials Engineering

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