



Design Engineering

OEM301 Bearing System Design

Recommended for

Design engineers directly responsible for machine design incorporating rolling element bearings at OEM facilities or users interested in optimizing performance in existing machinery. Those interested in optimizing rolling element bearing performance in rotating equipment.

Course objective

Students will gain an understanding of rolling element bearing, seal and lubrication technologies and theories used in selection processes for typical industrial applications, with the ultimate objective of improving the life, functionality, and operational reliability of rotating equipment.

2009 course schedule

May 12–15	Philadelphia, PA
Oct. 13–16	Chicago, IL

2009 tuition

Public classes	\$1,195
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On-site	
per class	\$13,995
# people	16
17+ people	\$445 per person

3.5 days

Course description

Bearing System Design uses a combination of hands-on training, directed exercises, audio visuals, lectures and discussion opportunities. Specific topics include:

Bearing theory

- Purpose of bearings
- Rolling element bearing history
- Rolling element contact behavior

Bearing components and functions

- Rolling elements, rings and cages
- Component materials

Selection of bearing type

- Advantages and disadvantages of various bearing types
- Bearing features and functionalities

Selection of bearing size

- Determining loads and duty cycles
- Bearing life determination using:
 - Basic L_{10} method
 - Adjusted life method
 - Optimizing bearing life with the latest life methodologies
- Computer-based tools (SKF.com, IEC and Bearing Select)

Bearing dimensional tolerances

- Dimensional tolerance classes
- Internal clearances and preload classes

Friction and speeds

- Friction model within rolling element bearings
- Speed rating methodologies

Bearing system design

- Associated component design
- Locating and non-locating
- Shaft and housing fits
- Selection of internal clearance or preload
- Bearing material selection
- Mounting and dismounting considerations
- Sealing requirements
- Mechatronics

Bearing arrangements

- Bearing types and integration

Lubrication

- Overview of lubricants
- Selection of appropriate lubricant
- Lubricant life estimation
- Lubrication methods

Machine system health

- Vibration analysis
- Temperature monitoring
- Lubrication analysis

Bearing damage and causes

- Analysis of common failure modes
- Mounting and operating conditions

Storage, shipping and handling

Prerequisites

Reading material*

- EVOL01_n01_p25 The SKF formula for rolling bearing life
- EVOL02_n01_p21 Simulation of dynamic behavior of rolling bearings
- GS04010 New life to machines
- GS03013 Design of bearing units

* On-line learning material at aptitudeexchange.com