

# KISSsys Training

Modeling Gearboxes (2 days)

System Calculations (1 day)

Model Customization (1 day)

# Basic and Advanced KISSsys Training

KISSsys is a powerful tool to model and analyze entire transmission systems. With the help of KISSsys your design process will increase in speed and reliability. There is no more manual data exchange needed between the single calculation modules or different programs. The results of all gearbox calculations will be available in an overview, even for different operating conditions. Modeling with KISSsys allows you to produce 3D models of the new design at the very early stage of the process.

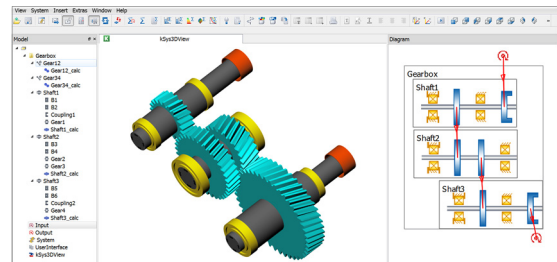
The training is divided in three parts. The first part “Modeling gearboxes” allows you to get started with KISSsys. During the two days you will get to know the interface of KISSsys and learn about modeling points and designing your first simple gearboxes. Thereafter, being the second part, you will be introduced to system calculations with KISSsys and KISSsoft by using various templates and analysis possibilities. The third part deals with the customization of finished models including the import and export possibilities. You will also see how to run KISSsys without using the graphical user interface.

The training course is aimed for engineers working in the field of gearbox calculation. The goal is to give users the knowledge on how to get started with KISSsys, learning about its scope and possibilities, so that participants can use the software for their specific applications in a more efficient way after the training.

# Part 1: Modeling Gearboxes

## Introduction to KISSsys

- Key benefits
- Important settings
- User and administrator mode
- User Interface and functionalities
- Terminology
- Using existing models
- Communication with KISSsoft modules for strength analysis



## Introduction to Modeling

- Plan the model
- Calculation of kinematics / power flow
- System based calculations regarding safeties, lifetime, weight and cost
- Generate user defined tables

## Modeling with Single Shafts

Examples of modeling a two-stage industrial gearbox and a bevel gear stage gearbox

- Creating a proper sketch
- Building the model with different methods
- Calculating and defining the kinematics
- Geometry definition of machine elements in KISSsoft Interfaces
- Sizing of gears, positioning of shafts and bearings according to the requirements
- Generating a User Interface table with variables for system information (operating data, safeties, lifetimes)

Exercise to build a simple industrial gearbox and use the sizing functionalities

## Special Kinematic Conditions

Models with One Input Two Outputs

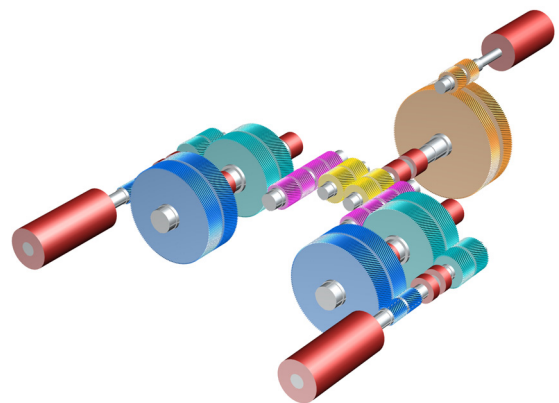
- Definition of boundary conditions
- Controlling power distribution

Gear Chain with Three Gears

- Handling of KISSsoft calculations
- Setting alternating bending factors

Overdefined Kinematics

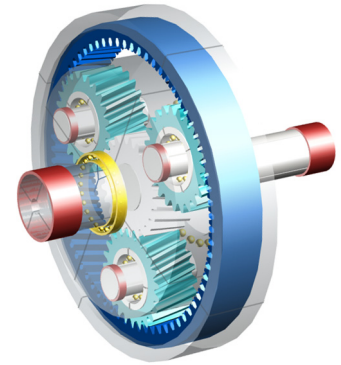
- Model with powersplits
- Using of gear activation method



## Coaxial Shaft Modeling

### Planetary Stage

- Important notes on the sketch
- Generation of the model, kinematics calculation
- Definition of the geometry in KISSsoft
- Modifying the positions of the groups
- Implementing of simple functions into a table
- Realization of multiple stages with spline connections
- Combination of single and coaxial shafts in one model



Summary of the first two days with a complete gearbox as an exercise.

## Part 2: System Calculations

### Data Handling in the System

#### Table of Variants

- Defining correct settings
- Varying gear and shaft calculation files

#### Using the Translation Table

- Creation of new variables
- Communication of KISSsoft variables to KISSsys

### System Based Calculations

#### Efficiency and Thermal Analysis

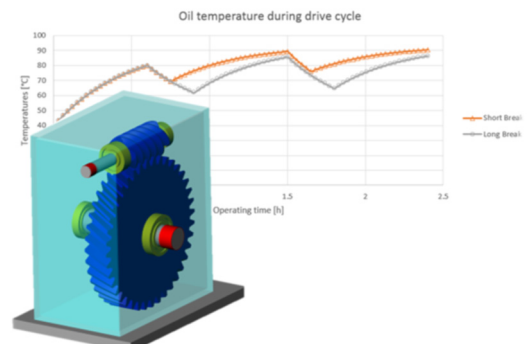
- Calculation of gear, bearing and churning losses
- Calculation of dissipation through housing and rotating parts
- Oil temperature over time

#### Load Spectrum Template

- Definition of a spectrum in KISSsys
- Calculation with different options
- Checking the result data

#### Housing Stiffness

- Theory
- Characteristics of a reduced stiffness matrix
- Reading in and calculating in KISSsys



## Modal Analysis

- Calculation of system eigenfrequencies
- Generation and evaluation of Campbell Diagram

## Part 3: Model Customization

### Predefined Tables in KISSsys Templates

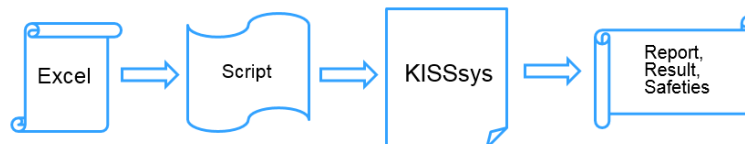
- Showing entered values and results for gears, bearings and shafts in an overview
- Modifying and extending existing tables
- Creation of new interfaces

### Programming using Script Language ClassCad

- Basic terminology
- Import a file and fill up variables
- Export of user defined results
- Practicing with useful examples

### Running KISSsys without GUI

- Running KISSsys in batch mode
- Controlling of the model with a script file
- Automatic generation of results for different configurations



The screenshot displays the KISSsys software interface with four main windows:

- kSvs3DView:** Shows a 3D model of a gear assembly with two shafts and four gears.
- ShaftCalculations:** A table showing parameters for Main and Side shafts.
- GearPairCalculations:** A table showing gear pair parameters for GP1, GP2, GP3, and GP4.
- BearingCalculations:** A table showing bearing parameters for shaft1.

	Main	Side	sr_calc
n	3000	1285.7	1236.4
dn	clockwise	counter clockw	0
material	C45 (1)		
xmin	-0.087123	-0.38922	0
xmax	0.18923	0.079451	0
zmin	-0.20747	-0.71964	-2.1292e-007
zmax	0.44032	0.16573	0
SDA	0	0	0
SSA	0	0	0
RDA	0	0	0
RSA	0	0	0

fileName	GP1	GP2	GP3	GP4
P	0	47.124	0	8.9289e-015
T1	0	150	0	2.8422e-014
T2	0	285.35	0	2.6235e-014
n1	3000	3000	3000	3000
n2	1285.7	1545.5	2357.1	3250
mn2	2	2	2	2
beta2	20	20	20	20
alpha2	20	20	20	20
z1	15	17	22	26
z2	35	33	28	24

	b1	b2	b1	b2	br	b1
shaft1	sa	sa	sb	sb	^_sa	^_sb
Bform	Deep groove I	Deep groove I	Deep groove I	Deep groove I	Needle cage	Need
BType	SKF 6204	SKF 6004	SKF 61804	SKF 6004	Koyo 20V271	Koyo
d	20	20	20	20	20	20
D	47	42	32	42	27	27
b	14	12	7	12	15	15
Fx	1597.2	2078.6	-2234.4	-1367.8	0.00015108	-3.4
Fy	-3017.8	-1.0425e-012	-0	2957.5	-0	-0
Fz	4165	3922.3	-3552.4	-4398.1	0.6366	0.6366
Tx	36.708	-3.0385	-28.17	37.459	-0.00054602	0