

BASIC TRAINING TEACHABLE COURSE

OVERVIEW

This course is designed for new Flownex users and provides a structured introduction to thermal-fluid system modelling. Through practical examples, participants will become familiar with the Flownex environment and learn essential simulation techniques.

COURSE VIDEO DURATION	MODULES REQUIRED
Session 1: 33 minutes Session 2: 50 minutes Training Assignment: 64 minutes Total: 2 hours 27 minutes Recommended time needed to complete the course: 7.5 hours	Flownex modules required – modules will be provided for 3 days to complete the training. • Thermal fluid module • Advanced thermal fluid module • Design and analysis module • Transient module • Control module

COURSE STRUCTURE

SESSION 1: FUNDAMENTALS	SESSION 2: ADVANCED FEATURES
• Introduction to the Flownex user interface, and basics of starting a project. • Principles of pressure drop and the electrical network approach (Fourier's law) - Bernoulli's equation - Exercise 1: Simulating pressure drop through a pipe - Exercise 2: Pump sizing - Exercise 3: Simulating ambient heat loss in piping using the Dittus-Boelter correlation • Best practices for building and organising system simulation networks • Understanding and resolving common Flownex simulation warnings and errors	• Application of advanced Flownex capabilities - Exercise 1: Designing a pump-pipe arrangement to deliver a desired volumetric flow rate target - Exercise 2: Performing a sensitivity analysis of upstream pressure to pipe diameter - Integrating custom formulas and logic using Scripting or Excel components - Performing transient (dynamic) simulations - Introduction to modelling control systems

TRAINING ASSIGNMENT

- **Objective:** Design and control a bearing cooling system to maintain temperatures between 40 °C and 50 °C
 - Balancing flow networks for cooling water and a closed-loop oil circuit
 - Sizing and selecting pipes, pumps, and valves
 - Heat exchanger sizing
 - Simulating the control system regulating coolant flow
 - Building a human-machine interface (HMI) suitable for training an operator