Course Outline:

Writing Advanced SQL Queries (*Course T929*)

**What is this course about?**
SQL is the cornerstone of all relational database operations. In this hands-on course, you learn to exploit the full potential of the SELECT statement to write robust queries using the best query method for your application, test your queries, and avoid common errors and pitfalls. It also teaches alternative solutions to given problems, enabling you to choose the most efficient solution in each situation. The course describes the ANSI/ISO SQL standard, but also identifies deviations from the standard in the two most widely used database products, Oracle and Microsoft SQL Server.

**Who should attend?**
Those who are developing applications using relational databases, or who are using SQL to extract and analyze data from databases and need to use the full power of SQL queries.

Experience with SQL Server at the level of Course T925, *SQL Programming Language Introduction*, is assumed. For example, you should be familiar with relational database theory and concepts (tables, columns, primary and foreign keys), as well as the basics of `SELECT` statements.

**Duration:**
3 Days

**Chapter 1: SQL Overview**
- Use client tools to execute SQL statements
- Describe the clauses that occur in a query
- Point out potential problems with NULL values
- Introduce a tool for performance analysis
- Give some recommendations for testing

**Chapter 2: Querying Multiple Tables**
- Combine several tables into one result
- Use different kinds of table joins
- Identify potential join problems
- Use UNION to combine result sets
- Use recursive CTEs to traverse hierarchies

**Chapter 3: Scalar Functions**
- Arithmetic functions
- Functions for data type conversion
- Functions for string manipulation
- Functions for simulating `IF` tests
Chapter 4: Aggregate and Windowing Functions
- How to use aggregate functions
- How to specify aggregates in groups
- Filtering on aggregate values with \texttt{HAVING}
- How to build crosstabs
- Using aggregate functions as windowing functions
- Ranking functions

Chapter 5: Nested Queries
- Use nested queries for building \texttt{WHERE} conditions
- Learn the difference between correlated and noncorrelated subqueries
- Identify potential problems with subqueries
- Use subqueries as expressions anywhere in an SQL statement

Chapter 6: Course Summary