

**Length:** 2 Days

**Course Description:** First, DB2 programming is reviewed in detail. The following areas are presented, discussed and built into programs - DB2 Referential Integrity Inner and Outer Joins 3, 4, 5 and 6 way joins Scrollable Cursors. Use the expanded use of Unions ('everywhere') Fetching 1 (or 2 or 15) Row only Indicator Variables Dynamic SQL Nested Table Expressions The CASE expression and column functions and scalar functions Check Constraints Create tables, views and indexes. DB2 performance guidelines are discussed in detail. The SQL statement EXPLAIN PLAN is used to help to evaluate the efficiency of SQL statements. Advanced Programming Performance considerations are presented to "tuned" programs to perform "better" than their "untuned" counterparts.

**Audience:** Experienced Data Processing personnel who need use more of the "advanced" features of SQL to access DB2 tables in COBOL programs.

**Prerequisites:** At least six month of DB2 COBOL Programming experience is required.

## Topics:

### Day 1

#### Introduction to DB

- Course Introduction
- DB2 - Concepts, and Terminology
- Structured Query Language (SQL)
- SQL 1 - The SELECT Statement
- Database 2 Interactive
- SQL 2 – SQL Functions
- SQL 3 - ORDER BY, GROUP BY, HAVING
- SQL 4 - Join, Sub-select, UNION
- SQL 5 - Data Definition Language
- SQL 6 - INSERT, UPDATE, DELETE
- SQL 8 – Other SQL Topics
- III. DB2 Application Programming
- 10. SQL Programming I - Overview
- 11. SQL Programming II - Data and Procedure Division Changes
- 12. SQL Programming III - SELECTing Multiple Rows
- 13. Concurrency Control - Locking
- 14. SQL Programming IV - INSERT, UPDATE, DELETE

### Day 2

- IV. Additional Topics
- 15. SQL Programming V - Other Programming Considerations
- 16. DB2 Performance Introduction
- Group I – Single Table Access Exercises
- 1. Create tables and Read a table with a program
- 2. Referential Integrity – by DB2 OR by the Application
- 3. Handling Nulls – Select, Insert, Update
- 4. Dynamic SQL – Update, Delete, Select
- 5. Nested table Expression – Single Table
- 6. CASE and Scalar/Column Functions
- Group II – Multiple Table Access Exercises
- 7. Nested table Expression – Multiple Tables
- 8. Scrollable Cursors
- 9. UNION Everywhere
- 10. Inner & Outer Joins



## DB2 for z/OS Application Programming - Advanced

- 11. More than 2 table Joins
- 12. Limiting Rows Fetched
- Group III - Additional Advanced Programming Considerations
- 13. Other Topics - Triggers, Check Constraints, UDT, UDF
- 14. Performance - EXPLAIN (YES)

**Appendices**

Appendix A - IBM Sample Tables	Appendix I – DB2 for WINDOWS Overview
Appendix B – Bibliography	Appendix J – Additional Features - UDT / UDF, Trigger, Casting
Appendix C - The Programming Workshop	Appendix K – Group By Extensions
Appendix D – Plan_Table & Dsn_Statemnt_Table	Appendix L – Visual Explain Overview
Appendix E - Hints to Success	Appendix M – Functions
Appendix F – SQLCODES / SQLSTATES	Appendix Z8– Changes Summary - DB2 V 8
Appendix G – QMF Overview	Appendix Z9 - Changes Summary - DB2 V 9
Appendix H – Stored Procedures	Appendix Z9 - AppV9B - DB2 V9 Summary from IDUG Solution Journal