

Course Name: Advanced RPG4 Programming & ILE

Course Code: ISR4A

Duration: 4 Days

Price: £ 2,200

Prerequisites: A basic understanding of RPG programming techniques as covered in the RPG4 Programming course (ISR4P).

Course Outline:

Review of RPGIV Keywords, Operation Codes & Built In Functions

Free format Control, File and Definition statements

Using Date & Time Variables and Functions

Using Null Capable fields

Compile Time and Run Time arrays

Data Structures [Basic, Multiple Occurrence & Multi-dimensional]

Data Areas

Pointers & Dynamic Storage

Introduction to teraspace storage model

Commitment Control & Journalling Concepts

Sub-procedures

Local & Global Variables & Procedures (Export)

ILE Concepts

Debug Considerations & Encryption

Module & Service Program Creation & Management

Binding Directories & Binder Source

Activation Group Considerations

Course Content:

RPGIV review and Update

- Be aware of all RPGIV operation codes
- Understand the commonly used built in functions
- Be clear on the course objectives & pre-requisites
- Be able to code Free form Control statements CTL-
- Be aware of all Free form definition statements DCL-
Files, Variables, Procedures

Date & Time variables plus null capable fields

- Define initialise and use variable types:
Date, time, timestamp
- Covert non-date variables to date variables
%DATE , %TIME, %TIMESTAMP
- Manipulate data in true date variables
%DAYS, %MONTHS, %YEARS, %DIFF, %SUBDT
(%HOURS, %MINUTES, %SECONDS, %MSECONDS)
- Validate the content of a date variable (TEST)
- Convert true date variables to non-date variables
%CHAR, %DEC
- Define & Use null capable fields:
ALWNULL, %NULLIND

Arrays

- Declare and use an Array
- Differentiate between compile & run time arrays
- Provide compile time data
- Use the repeat operation code FOR
- Understand the legacy code DO
- Understand how to use the array BIF's:
%XFOOT, %LOOKUPxx, %SUBARR
- Be aware of legacy op codes: XFOOT, LOKUP
- Sort array content: SORTA

Data Structures

- Define and use a data structure
- Recognise different types and uses of data structures
- Hard code the sub structure of a data structure
- Understand how file information data structures can be used in report programming
- Redefine the sub-structure – OVERLAY
- Duplicate structures with QUALIFIED

- Initialise data structure and sub-structure
- Code and use a program status data structure
- Code and use a file information data structure
- Code free format data structure statements

External and Multiple Definitions

- Retrieve a sub-structure from an external file EXTNAME
- Use other structures: LIKERECD, LIKEDS, QUALIFIED
- Rename sub-structure fields EXTFLD, PREFIX
- Use long fields names from external definition ALIAS
- Code and use a multiple occurrence data structure
- Overlay arrays within a data structure
- Use array BIF's %ELEM, %SIZE, %OCCUR
- Understand and replace MOVEA legacy op code
- Sort linked arrays
- Read multi-dimensional arrays & Complex Data structures
- Sort and Search techniques of Data Structure Arrays

Data Areas

- Define and use a data area
- Describe and use the LDA
- Understand and use the operation codes:
 IN, OUT, UNLOCK
- Link Data areas to Data Structures
- Use and declare a user controlled data area
- Free format Data Area Definition Statements
- Soft Code Data Areas

Pointers and Dynamic Storage

- Define and use a pointer variable
- Define storage space at run-time (based)
- Use Dynamic Storage
- Understand and use Dynamic storage commands:
 %ADDR, %ALLOC, %REALLOC & DEALLOC
- Declare Variable length & Null terminated strings

Commitment Control

- Understand commitment control requirements
- Understand how Commitment Control works
- Understand when to use commitment control
- Maintain files under commitment control
- Include commitment control into RPG program
- Use a MONITOR error trap

Sub-procedures and Optional Parameters

- Code a Sub-procedure
- Understand local & global variables
- Understand the need for and code a prototype
- Use the operation code CALLP
- Alternative parameter passing methods:
 - By reference, Read-only Reference, Value
- Define and use optional parameters:
 - *OMIT, *NOPASS, %PARMS
- Default Activation Group considerations
- Faster Return Values %PARMNUM, RTNPARM
- Code a reusable sub-procedure

ILE Concepts and Introduction

- ILE v OPM
- Relationship between program and module objects
- Dynamic call v Static call
- ILE program and module object information – DSPPGM, DSPMOD
- Convert CLP to CLLE & modules. CL procedure Call - CALLPRC
- Binding CL and RPG together into a single program
- Update ILE program objects
- Include copyright into module objects
- Application isolation with Activation groups
- Controlling which activation group is used
- Reclaim resources for an activation group
- Bindable API's

RPG Modules

- Bind RPG modules into programs
- Make source code available for interactive debug
- Define active PEP
- Understand export / import concepts
- Using export on sub-procedure definitions
- Define and use NOMAIN modules
- Code Cycle-Main and Linear-Main procedures
- Teraspace storage model v Single-level storage model

Service Programs & Binding Directories

- Bind by copy v Bind by reference
- Service Program creation and Maintenance
- Service Program exports and Public Interface
- Control Service Program Signatures
- Binder Language and QSRVSR
- Public and Private procedures
- Binding Directory objects
- Use of Binding Directory to simplify the program creation process

Follow on Courses: Potentially the Power RPG with SQL course (ISSQE) and the Introduction to Subfile Programming (ISRPS) course. Also consider the Rational Developer for i course (ISRDI).

Schedule:

2025

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Dates for this course will be scheduled on demand so please email or call for further details.