



GEMKO Information Group, Inc.

Information Systems Specialists

21st Century IBM i Developer Training Student Courses

www.rpgtraining.net

Course 0 – Introduction to RPG for Non-RPG Programmers

Length: 1/2 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model.

Course Description: This workshop prepares students having no RPG knowledge or experience, for the subsequent courses in this series.

Course Objective: You will learn basic concepts and terminology regarding how the RPG language is used to solve business problems on the IBM i (AS/400) platform.

Target Student: This course is designed for programmers with experience in other programming languages and basic knowledge of database concepts.

Prerequisites: None.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Understand RPG specific terms used in most training courses, including this series
- Recognize the components of an existing RPG program
- Conceptualize the logic flow of new or existing RPG programs
- Formulate a data access plan for new RPG programs
- Execute commands to create and manipulate RPG programs
- Navigate to IBM websites containing reference downloads

Course Content:

- A brief history of RPG
- Specifications
- Terminology primer
- RPG database processing concepts
- How to get started
- Reference sources



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Course 1 – Not Your Father’s RPG

Length: 2 days

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This is an intense RPG programming training workshop which explore the modern RPG language and problem solving methodology on the IBM i (formerly AS/400), up to and including the latest release.

Course Objective: You will receive sufficient exposure and hands on experience to become productive writing programs in RPG IV right away. Emphasis is on free form style – no fixed form is taught.

Target Student: This course is designed for either programmers experienced in legacy fixed form versions of RPG, or programmers experienced in other languages without any RPG background.

Prerequisites: Course 0 (for non-RPG programmers) or (for established RPG programmers) measurable experience with RPG II (System/36), RPG III (System/38 or AS/400) or fixed form RPG IV (AS/400).

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Reduce or eliminate hard coded data definitions in programs
- Define working storage more strategically to reduce non-productive program tasks
- Streamline cumbersome calculations with efficient new free form functions
- Reduce or eliminate the use of numbered indicators
- Leverage modern data types to perform tasks once relegated to program code
- Integrate new coding techniques within existing legacy code
- Introduce syntax and logic flow more consistent with cross platform modern languages

Course Content:

- High level overview of RPG III vs. RPG IV
- Evolution of traditional specification types (H, F, I, O)
- The D specification in detail
- Freeform calculation specs
- “Array” of sunshine
- Some pointers on pointers
- Old faithful op-codes and new friends
- Built-in Functions
- Reference sources
- Comprehensive labs



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Course 2 – Procedures & ILE Programming

Length: 1 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop helps transform the RPG programmer's way of thinking from traditional to more object oriented. Procedures help make your applications extensible and flexible. The Integrated Language Environment (ILE) allows business logic written in different languages to collaborate and co-exist seamlessly to support enterprise-wide applications.

Course Objective: You will learn how to leverage the benefits of the ILE architecture by organizing key business logic into tiny granules, such that it is written once and used throughout the application. Students will also learn how to interface with external programs and procedures more reliably.

Target Student: This course is designed for programmers who have become proficient in the RPG IV language and are seeking to eliminate redundancy and cloning from their applications.

Prerequisites: Course 1 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Create RPG procedures from scratch
- Build prototypes to interface with procedures and external programs
- Add flexibility to parameters and return values specified on prototypes
- Reuse procedures as building blocks for more complex procedures
- Understand program architecture as defined by the ILE model
- Organize procedures into service programs (similar to Windows DLL's)
- Share procedures with new and existing application programs
- Implement changes to critical business rules easily throughout the enterprise
- Further streamline executable code segments
- Utilize variable scoping

Course Content:

- Procedures versus subroutines
- Local versus global variables
- Extending the RPG IV function set
- Prototypes made easy
- Reduce, reuse and recycle code with ILE
- Did I say reduce?
- Nix the Fix – eliminate the fixed cycle baggage
- Performance considerations



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Course 3 – RPG IV and SQL, a 1-2 Punch

Length: 1 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop investigates ways to combine the unique powers of RPG IV and SQL development environments to provide even more flexibility and functionality.

Course Objective: You will learn how to enable SQL and RPG to complement one another in a business application, especially when one is better suited for a particular task than the other.

Target Student: This course is designed for programmers who have become proficient in the RPG IV language and are seeking better ways for their applications to harvest data.

Prerequisites: Course 1 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Write SQL queries from scratch
- Recognize the advantages of SQL over DDS and Query
- Perform database updates with SQL
- Access SQL function using several different System/i interfaces
- Get SQL and RPG to play nicely in the sandbox
- Make inquiry and report programs more user driven
- Combine data from multiple files for processing
- Make informed decisions whether RPG or SQL is better for a given task

Course Content:

- SQL crash course
- Embedding SQL inside RPG
- Host variables
- The SQL pre-compiler
- Using result sets
- Eliminating "F" specifications
- Building dynamic SQL
- SQL works best when you say UNION yes
- Performance considerations
- Comprehensive labs



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Course 4 – Triggers & API's

Length: 1 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop exhibits how to utilize database triggers, built into DB2, in order to better enforce business rules. API's provide access to IBM i resources above and beyond those of RPG IV and i/OS.

Course Objective: You will learn how to give your business logic a more “event driven” design, thus making it less defined by software and more defined by the database itself. Also, how to interface with or manipulate various IBM i objects via API's.

Target Student: This course is designed for programmers who have become proficient in the RPG IV and are seeking to improve the integrity of their database, as well as take advantage of more resources available on their IBM i or other platforms on their network.

Prerequisites: Courses 1, 2 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Identify opportunities to introduce work flow to their applications
- Write and apply trigger programs to database files safely
- Use the trigger buffer strategically
- Make future trigger programs easier
- Apply referential integrity rules to database files
- Test and attempt to violate these rules
- Interpret documentation in the API Finder
- Construct prototypes for API's
- React to API feedback

Course Content:

- The concept of work flow
- How triggers work
- RPG trigger programs & gotchas
- SQL triggers
- Referential integrity on IBM i
- Handling rules violations
- Navigating the API library
- Interfacing with API's
- Performance considerations
- Comprehensive labs



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Course 5 – Externalizing Modifications

Length: 1 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop explores ways to utilize IBM i programming techniques to enhance your 3rd party software without making modifications to their code, thus dramatically simplifying the deployment of new software releases.

Course Objective: You will learn how to extend the event driven philosophy from Course 4 to include your modification programming efforts, thus getting mods out of the vendor's code and into external objects under your control.

Target Student: This course is designed for programmers whose workload includes support of 3rd party software and execution of user requests for modifications to those software applications.

Prerequisites: Courses 4 and 1,2 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Recognize the true cost and risk of modifications
- Identify mods that are candidates for externalization
- Identify the principal impact point of a modification
- Leverage triggers to respond to data base activity
- Leverage API's to interrogate the run time environment
- Leverage data queues to respond to spooled file activity
- Approach screen mods from a different point of view
- Eliminate the "one mod fits all" traditional strategy

Course Content:

- The true cost of modifications
- Timing is everything – identifying impact points
- Using triggers and data queues strategically
- Event driven mods
- User specific mods
- Reformatting spooled files
- Simplifying screen modifications
- Performance considerations
- Comprehensive labs



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Course 6 – Extending to the Web – A “Primer”

Length: 1 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop demonstrates how to utilize IBM supplied tools to bridge the gap between your mission critical RPG business logic and the World Wide Web.

Course Objective: You will learn how to enable your RPG programs to output to web browsers on a real time basis, and thus generate dynamic web pages with your IBM i business data.

Target Student: This course is designed for programmers who are proficient in RPG IV and are looking to provide browser based access to their IBM i data and legacy RPG business functions.

Prerequisites: Courses 1, 2, 4 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Create and maintain an Apache server instance capable of running RPG programs
- Writing static HTML pages from scratch
- Build HTML forms to communicate with programs
- Use system API's to interact with the Apache server
- Modify RPG programs to be launched from and output to web pages
- Generate dynamic HTML through use of RPG
- Transform spooled files into browser friendly HTML

Course Content:

- Configuring the Apache server on IBM i
- HTML crash course
- Common Gateway Interface concepts
- Enabling CGI in RPG IV
- IBM's CGIDEV2 library (and why I hesitate to use it)
- Web enabling spooled files
- Performance considerations
- Comprehensive labs



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Course 7 – Advanced SQL & RPG, The Knockout Punch

Length: 2 days

Delivery Method: Instructor led, group-paced, classroom delivery learning model with structured hands-on activities.

Course Description: This RPG programming training workshop takes the SQL/RPG relationship to the next level, such that RPG may become less the application driver and more the application supporter. Since SQL is a cross platform development environment, this will make your applications friendlier to other platforms in your network.

Course Objective: You will learn how to use SQL to extend your core business logic which is securely rooted in RPG. At the same time, you will be exposed to problem solving techniques that are building blocks to low risk modernization strategies.

Target Student: This course is designed for programmers who are proficient in both RPG IV and SQL, and are looking to shift some of the application load off RPG and/or modernize that application from its strategic core outward.

Prerequisites: Courses 1, 2, 3 or comparable experience.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Architect database objects to be optimally flexible and compatible with most platforms
- Perform all database construction with SQL and its graphical tools
- Apply business rules using SQL
- Leverage RPG programs as SQL stored procedures
- Leverage RPG procedures as SQL functions
- Employ a more object oriented approach to data access in application programs

Course Content:

- Saying goodbye to DDS
- Creating your own data types
- Building your database the 21st century way
- Triggers and Constraints the SQL way
- User defined functions
- Case study – the standard cross reference
- Stored procedures
- Case study – A global item number change
- Performance considerations
- Comprehensive labs



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Course 8 – Rational Developer for Power Introduction / Prime Length: 1/2 day

Delivery Method: Instructor led, group-paced, classroom delivery learning model.

Course Description: This workshop introduces students to IBM's Rational Developer for Power software product (RDP) and how it can be used to carry out their daily duties on IBM i (AS/400).

Course Objective: You will learn how to get started and be quickly productive with this product. For those who have used IBM's Programming Development Manager (PDM), how to make the transition gracefully.

Target Student: This course is designed both for programmers who are new to IBM i, as well as those who have a wealth of experience with traditional IBM i tools such as PDM, Source Entry Utility (SEU) and Screen Design Aid (SDA).

Prerequisites: None.

Performance Based Objectives: Upon successful completion of this course, students will be able to:

- Understand the strategic advantages of using Eclipse based tools
- Configure and tailor RDP to their specific environment
- Utilize the various views and panes within RDP strategically
- Carry out traditional green screen (PDM) functions in RDP's graphical environment
- Create and maintain source code (CL, RPG, etc.) using the LPEX editor
- Test and debug both batch and interactive programs from within RDP
- Navigate to IBM reference websites
- Continue on the learning path

Course Content:

- Why re-invent myself now?
- The Eclipse workbench and RDP
- One time setup tasks
- Navigating Remote Systems Explorer (RSE)
- Source editing
- Compiling and running
- Debugging tools
- Screen Designer
- Reference sources
- Optional follow along if hardware and software prerequisites are met



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PHP for IBM i
“Jump-Start” package
www.rpgtraining.net

Course JSPHP – Graphical User Interface (GUI) enablement

Length: 1 day

The GEMKO “Jump-Start” package includes:

- a. Installation of Zend PHP on your IBM i
- b. Creation of a “Pilot” browser based application integrated with OS/400 DB2 data; application to include up to:
 - i. 2 screens
 - ii. 20 columns of data from no more than 3 files
 - iii. column level sorting
 - iv. function to create excel spreadsheet

Expected Benefits and Values:

- IBM i Information / Application’s accessed via a web browser
 - Improved presentation “look & feel”
 - Extended access for internal employees, external employees, vendors, customers...
 - IBM i DB2 data integration with excel
- PHP technology framework in place to deploy additional browser based applications on your IBM i
- IBM i Application Modernization & Extension Path

Package fee: *call for pricing*

Terms & Conditions:

- *iSeries must be at OS/400 V5R3 or higher.*
- *Obtaining Zend PHP software and licensing is customer responsibility (as an IBM Business Partner, GEMKO can assist with ordering the product).*
- *Network access (internal or external) is customer responsibility.*
- *Database knowledge required to create the application is customer responsibility.*
- *GEMKO is not liable for any system degradation resulting from the implementation of PHP environment.*
- *GEMKO Customer Agreement must be on file to perform services.*

For more information on PHP, go to:

<http://www.zend.com/en/products/core/for-i5os>

<http://www-03.ibm.com/systems/i/software/php/>



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DB2 Web Query for IBM i
“Jump-Start” package
www.rpgtraining.net

Course JSDBW – Business Analytics and Report Distribution Length: 1 day

The GEMKO “Jump-Start” Package includes:

- c. Installation of the DB2 Web Query Tool on your IBM i
- d. Migration of up to 10 existing Query/400 queries
- e. Create two New DB2 Web Queries (no more than two file joins)
- f. Jump-Start DB2 Web Query training session for up to 4 employees on how to create queries (½ day educational Course under this offer)

Expected Benefits and Values:

- Legacy reports migrated to Live Browser / PC based reports
 - Improved presentation “look & feel”
 - Extended access for internal employees, external employees, vendors, customers...
 - Report / Information distribution via email, excel, PDF, HTML
- DB2 Web Query technology framework in place to deploy additional browser / PC based reports on your IBM i
- DB2 Web Query skills built and knowledge transferred to your staff to deploy additional browser based reports

Package fee: *call for pricing*

Terms & Conditions:

- *iSeries must be at V5R4 or OS/400.*
- *Obtaining DB2 Web Query software and licensing is customer responsibility (as an IBM Business Partner, GEMKO can assist with ordering the product).*
- *GEMKO is not liable for any system degradation resulting from the implementation of DB2 Web Query.*
- *Package fee does not include travel and/or related expenses.*
- *GEMKO Customer Agreement must be on file to perform services.*

For more information on DB2 Web Query, go to:

<http://www-03.ibm.com/systems/i/software/db2/webquery/index.html>