



This course is intended to quickly bring the application programmer up to speed in an OpenVMS environment. The scope of material is fairly broad from basic compiling to advanced system services. Although some of the material will be provided as an exposure to capabilities available to the programmer, it is expected that the students will be able to program at an in depth level upon completion of this course. The course covers the following categories: General Programming, Synchronization, File System and RMS, Processes and Scheduling, and Memory Management.

#### Audience

- OpenVMS Application and System Programmers

#### Prerequisites

- Students should have a fundamental understanding of HP OpenVMS System concepts and should be familiar with the C programming language, including the use of structures and pointers

#### Course Objective

This course is designed to take a programmer with basic DCL understanding and provide the foundations to take advantage of all available features of the OpenVMS operating system. The course will be driven by examples of the use of major system services and run-time library procedures. Most examples are provided in both C and FORTRAN and one other language: Macro-32, BASIC or COBOL. Only components provided with a standard distribution will be addressed in this course, i.e. other than the compiler, no layered products are incorporated into the course. The course includes lab exercises designed to reinforce the skills taught.

## Benefits to You

Although the material is broad and some of it will be absorbed only as an overview, it is expected when the student leaves the course she/he should minimally be able to:

- Compile and link a program
- Read listing and map files
- Understand call procedures, including system services and run-time library routines
- Create a process
- Communicate with another process
- Synchronize using event flags and locks.

**Course Title:** he634sc.00 HP OpenVMS v8.3 Programming Features

**HP Product Number:** he634sc.00

**Category/Subcategory:** OpenVMS

**Course Length:** 5 days

**Level:** Intermediate

**Delivery Language:** English

**To Order:** You can order this course online at <http://www.hp.com/learn>. At the site, select a country, then choose "registration" or "Book a course" and fill out the online registration form.

## Detailed Course Outline

### Introduction

- CISC vs. RISC vs. EPIC Architectures
- Data Types
- OpenVMS Access Modes
- OpenVMS Processes
- OpenVMS Alpha Memory Management
- OpenVMS Calling Standard

### Compiling and Linking

- OpenVMS Compilers
- Common Compiler Options
- Link Command
- Image Activation
- Symbolic Debugger
- Data Alignment
- Symbolic Naming Conventions
- Libraries Used by Compilers and Linkers

### Library Routines

- Floating Point Formats and Conversion
- Run-Time Library Routines
- General Purpose Library Routines
- Screen Management Library
- String Manipulation Library
- Utility Routines
- System Services

### Events and Synchronization

- Synchronization
- Events Flags
- The "I/O" Status Block
- Asynchronous System Traps

### RMS

- RMS Concepts
- RMS Structures
- RMS Services
- Special Language Considerations
- RMS System Services Examples
- File Sharing and Record Locking
- Language Specific Considerations
- RMS Utilities

### Low Level I/O

- Assigning Channels
- The QIO System Service
- File I/O
- Terminal I/O
- Mailbox I/O

### Fast I/O

- Buffer Objects
- Fast I/O Concepts
- Implementing Fast I/O

### Lock Manager

- Locking Concepts
- OpenVMS Support for Locking
- OpenVMS Lock Implementation

### Time and Timers

- Time Formats
- System Time and Time Conversion
- Coordinated Universal Time (UTC)
- Library Routines Supporting Time
- System Timers

### Processes and Scheduling

- The Process
- Image Activation
- Process Creation
- Getting Job/Process Information
- Process Selection
- Process Management / Control
- Terminating Images / Processes
- Exit Handlers

### Shareable and Resident Images

- Shareable Images
- Resident Images

## Memory Management

- Memory Allocation
- Process Sections
- Working Sets and Swapping
- 64-bit Memory Usage

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