

**Course Description:** The course begins with a thorough treatment of packages, modules, and libraries. Next, Perl references are studied. This gives students the necessary background to write object-oriented Perl. Various applications areas that use object orientation are studied next. These modules include the Tk.pm module for building Graphical User Interfaces, the DBI.pm module which provides a portable way of querying databases, the CGI.pm module for writing CGI programs, and the Socket.pm module used in client server networking applications. Finally a treatment of XML and Perl is undertaken.

**Who Should Attend:** Programmers, end users, system administrators, network administrators, CGI script writers should attend this course.

**Prerequisites:** Participants should be well-versed in the fundamentals of Perl.

**Benefits of Attendance:** Upon completion of this course, students will be able to:

- Download, install, and use Modules from the Comprehensive Perl Archive Network (CPAN).
- Use the modules in the Standard Perl Distribution.
- Write POD (Plain Old Documentation) sections of Perl modules.
- Use Perl references to solve many programming problems including those problems involving arbitrarily complex data structures.
- Distinguish among packages, modules, libraries, and classes and use each one effectively.
- Write client/server applications using the Socket.pm module.
- Write Graphical User Interfaces (GUIs) by using the Tk.pm module.
- Write Perl CGI (Common Gateway Interface) scripts.
- Write Perl applications that make queries to real databases through the use of the DBI.pm module.
- Write Perl applications that produce and process XML documents.

### Course Outline:

#### What You Should Already Know

A Quick Review of Perl  
Perl Libraries  
The Standard Perl Library  
Packages  
Modules  
Using .pm Modules  
Exporter.pm  
Standard Perl Modules  
The Comprehensive Perl Archive Network (CPAN)  
Roman.pm  
The wantarray function

#### Associative Arrays

Associative Arrays as Dual Arrays  
A Hashing Algorithm  
Collisions  
Associative Arrays  
Sorting by Keys or Values  
Finding Unique Tokens in a File  
Reverse Lookups  
Selecting the Top n Elements

#### References

Summary of References  
Array References  
Anonymous References  
Prototypes  
Higher Dimensional Arrays  
Complex Hashes  
References and Subroutines  
Anonymous Subroutines  
Lists of References

#### Object-oriented Programming

Object-Oriented Vocabulary  
The class Definition  
Defining and Using Objects  
Information Hiding  
Instance Methods  
Destructors  
Class Methods  
Inheritance  
Polymorphism  
Documenting Perl Code  
IO.pm

#### The Tk.pm Module

Event Driven Programming  
Geometry Management  
pack()  
grid()  
grid() Options  
place(): Absolute Coordinates  
place(): Relative Coordinates  
The Label Widget  
The Button Widget  
The Checkbutton Widget  
The Radiobutton Widget  
The Dialog Widget  
Text Input Widgets  
The Listbox Widget  
Menus and Frames  
Toplevel Widgets  
Bind

#### Client/Server Applications And CGI

Internet Terminology  
Data Delivery  
Writing a Simple Client  
Writing a Simple Server  
Writing an Iterative Server  
ftp  
The Common Gateway Interface  
HTML Forms  
The CGI Environment  
Administering the Server  
The HTTP Protocol  
Header Information  
The CGI Script  
Extracting Form Data  
The CGI Response  
CGI Output  
Database Access  
What Can Go Wrong  
Images  
Extra Path Information

#### CGI.pm

Using CGI.pm?  
Creating Headers and Footers  
Tags  
Tables  
Creating Forms  
Text Fields  
Text Areas

Passwords  
Checkbox Group  
Individual Checkbox  
Radiobutton Group  
Popup Menu  
Scrolling List  
Reset Button  
Hidden Field  
Submit Button  
Clickable Image  
Cookies  
Debugging  
The Functional Approach

#### Accessing Real Databases In Perl

Architecture  
Review of SQL  
Accessing Databases from Perl  
Executing a Query in Perl  
Accessing Database Metadata  
Interactive Requests  
Adding a Graphical Front-End  
Accessing a Real Database via a Web Form

#### XML Fundamentals

What is a Markup Language?  
SGML vs. HTML  
Sample HTML Document  
XML  
Creating Semantic Tags  
XML Syntax  
Elements  
Attributes  
Comments  
Unicode and Character Sets  
Character References  
Entity References  
Character Data Sections (CDATA)  
Processing Instructions  
Parsing XML

#### Processing XML With Perl

Creating an XML Document With Perl  
Creating an XML Document  
Using an XML Parser  
XML::Simple  
XML::Parser