

# **Fortran Programming**

## **Audience Course Fortran Programming**

The course Fortran Programming is intended for anyone who wants to learn how to program in the Fortran programming language.

#### **Prerequisites Course Fortran Programming**

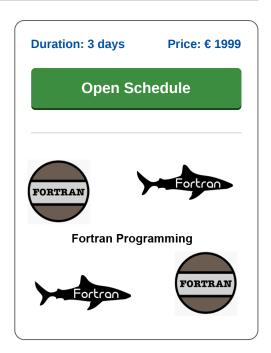
To participate in this course, basic knowledge of programming in another programming language is beneficial to the understanding but is not required.

## **Realization Training Fortran Programming**

The theory is discussed on the basis of presentation slides. The theory is explained further through demos. After discussing a module, there is the possibility to practice. Course times are from 9.30am to 16.30pm.

### **Certification Course Fortran Programming**

After successful completion of the course participants receive an official certificate Fortran Programming.



# **Content Course Fortran Programming**

In the course Fortran Programming participants learn to develop applications in the latest version of the Fortran language. Fortran was originally created in 1957 to perform mainly scientific calculations. Over time however, Fortran has evolved into a higher programming language with support for modern concepts such as object-oriented programming.

#### **Fortran Intro**

The course starts with an overview of the development of Fortran and then covers data descriptions, control structures, data processing and Fortran Rules.

# **Variabelen and Data Types**

Also variables, data types and operators in Fortran are treated. Special attention is paid to Fortran arithmetic with rounding, truncation and integer division.

# **Tabular Data and Arrays**

Subsequently tabular data and arrays are also discussed. Attention is paid to allocatable arrays, multidimensional arrays, array constructors and operations that work on entire arrays.

#### File I/O

Fortran naturally also has facilities for accessing the file system. Formatted and Unformatted File I/O are therefore discussed in the course and Records, Data Edit Descriptors and End of Record indicators are treated as well.

#### **Functions and Flow Control**

Then it's time for functions and control flow in Fortran. Attention is paid to library functions, transformation functions, recursive functions, user defined and pure functions. And the various control flow constructions for selections and iterations are reviewed as well.

#### **Characters**

Special attention goes to dealing with characters in Fortran. Character Input, Character Operations, Character Sets and Edit Descriptors are discussed.

# **User Defined Types and Pointers**

Finally special types in Fortran such as User Defined Types and pointers are on the program of the course and object oriented programming in Fortran with classes, objects and inheritance is treated.

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# **Modules Course Fortran Programming**

Module 1 : Fortran Intro	Module 2 : Language Syntax	Module 3 : Arrays
Fortran Language	Variables	Tabular Data
Fortran's Origins	Names and Values	Dimension Attribute
Version 77 to 2008	Data Types	Setting Array Size
Fortran Compilers	Fortran Characters	Indexing
Structured Programming	Operators	Loop over Arrays
Data Description	Arithmetic	Allocatable Arrays
Control Structures	Expression Equivalence	Multiple Dimensions
Data Processing	Rounding and Truncation	Whole Array Manipulation
Fortran Rules	Integer Division	Element Ordering
Input and Output	Type Conversion	Array Constructors
Module 4 : File I/O	Module 5 : Functions	Module 6 : Control Flow
Opening Files	Predefined Functions	Selections and Iterations
Close Statement	Generic Functions	Block if Statement
Writing Files	Elemental Function	if then endif
Formatted and Unformatted	Transformation Functions	else Statement
Data Edit Descriptors	Function Usage	case Statement
Skipping Lines	Intrinsic Procedures	do loop
Records	Custom Functions	do while
Data Transfer Statements	Local Variables	cycle Statement
inquire Statement	Recursive Functions	exit Statement
End of Record	Pure Functions	Sentinel Usage
iostat and iomsg	Rules and Restrictions	forAll Statement
Module 7 : Characters	Module 8 : Special Types	Module 9 : Modules and Classes
Character Input	Type Definition	Module Syntax
* Edit Descriptor	Variable Definition	Global Data
a Edit Descriptor	Nested Derived Types	private, public, protected
Character Operations	Pointers	use Statement
Substrings	Pointer Concepts	Explicit Interfaces
Character Functions	Referencing Pointers	Classes and Objects
len and len_trim	Pointer Allocation	Structure Constructors
Collating Sequence	Pointer Assignment	Generic Names
Character Sets	C loc Function	Polymorphic Variables
scan Function	Memory Leaks	Inheritance