

## MARUM / GLOMAR Basic Skills and Methods Course:

### An introduction to programming in Fortran

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#### Objectives

Many years after its original introduction, the Fortran programming language is still dominating the fields of scientific and numerical computing. Several factors contribute to this popularity: excellent computational efficiency, availability of wide selection of high-quality libraries of numerical routines, as well as the gradual evolution of the language, to meet the demands of the modern researchers.

In this course, we present the basic elements of Fortran programming, which are useful for researchers in Earth System Sciences, emphasizing the recent versions of the language.

#### Topics

(1) First, we discuss the basic building-blocks, which appear in almost any Fortran program:

- variables
- input/output
- program flow-control (IF, CASE, DO, etc.)
- arrays and array expressions
- defining procedures

(2) The second part focuses on more advanced topics, which help programmers to write more maintainable code, or which are specific to scientific computing in the climate sciences:

- object-oriented programming
- working with multiple source-code files
- writing and reading netCDF data
- interfacing Fortran and Python

At the end, participants will have the opportunity to ask specific questions related to their research.

#### Target group

Beginners. Prior programming experience is not required, but would be helpful.

## Software used in the course

- a fortran compiler (preferably "gfortran")
- netCDF libraries
- (for visualization) Python, with the following packages installed: numpy, matplotlib
- (ideally, also) IPython notebook, with the extension "fortran-magic"

### ***Please note:***

*Participants who would like to **bring their own laptops** may do so but are responsible to make sure that the software is running properly by the beginning of the course.*

***During the course**, support can only be given for laptops provided by GLOMAR. The main operating system during the course will be Windows.*

## Location and time

MARUM, University of Bremen, Leobener Str., 28359 Bremen, Germany, Room 2060  
09.00 – 17.00 hrs.

## Registration

To register for this course, please fill in the [registration form](#).

*Please note that your registration will be binding.*

The registration deadline for this course is **15 November 2015**

Any enquiries regarding the course should be addressed to [glomar-courses@marum.de](mailto:glomar-courses@marum.de).