

Introduction to Programming: FORTRAN Short Course

Scheduling: Tuesdays 3:00-5:00p in ATS 101

Instructor: Kate Thayer-Calder

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Office Hours every Thurs 2:00-3:30p

Class Website: <http://www.atmos.colostate.edu/gradprog/programming/>

Date	Topics
25 - Aug	<ul style="list-style-type: none">•Another Intro to Computer Science•How a Computer Actually Works•UNIX Introduction: What is an Operating System?•UNIX vs LINUX vs MacOSX vs Windows (basics)•Getting ready to program: Compiler, Home directory, Text Editor•Creating and Compiling a Fortran Program•Print is your friend•Variables, Types, Arrays, Arithmetic Functions, Order of Operations
01 - Sep	<ul style="list-style-type: none">•Everyday UNIX: Man pages, File and directory manipulation, program input and output, processes, basics of Emacs and Vi•More on FORTRAN Arrays•Logical Operators•Conditional Statements•Looping options•Subroutines and Functions•Discussion of Scientific Computing
08 - Sep	<ul style="list-style-type: none">•Using UNIX on a network: Basics of networking, FTP, SSH, Tar/Zip, Mount, network utilities, a little HTML•Makefiles•Strings, strings, strings•Higher dimensional arrays•Reading/Writing Formatted and Unformatted Data•Basic discussion of modeling
15 - Sep	<ul style="list-style-type: none">•Searching on UNIX: Grep, awk, pattern matching and regular expressions•Some plotting and visualization options•Fast math in FORTRAN•Modules and organizing big programs•User Defined Data Types•Reading/writing scientific data•Dealing with missing or poor quality data

Date	Topics
22 - Sep	<ul style="list-style-type: none"> •UNIX Shell Scripting: little programs to do useful things, maybe some Perl or Python •Algorithm analysis and program optimization •FORTRAN Compiler options and flags •Debugging, Debugging, Debugging •Class requested topics

UNIX Resources

Some books:

- ***Linux in a Nutshell*** by O'Reilly Publishing
- ***The Student's Guide to Unix*** by Harley Hahn

Useful Websites:

- **Computer Hope** <http://www.computerhope.com/unix.htm>
- **Unix Tutorial for Beginners** <http://www.ee.surrey.ac.uk/Teaching/Unix/>
- **Unix Cheat Sheet** <http://www.rain.org/~mkummel/unix.html>
- **Shell Scripting** <http://www.faqs.org/docs/air/tshell.html>

FORTRAN Resources

Some good books:

- ***The Fortran 2003 Handbook*** by Adams, Brainard, Hendrickson, et al.
- ***Fortran 90/95 for Scientists and Engineers*** by Stephen J Chapman
- ***Introduction to Programming with Fortran*** by Ian Chivers and Jane Sleightholme

Some good websites:

- **Randall's Rabbits Fortran Class** <http://kiwi.atmos.colostate.edu/fortran/>
- **Fortran 90 3 Day Course** <http://www.liv.ac.uk/HPC/F90CourseIntro3DayHomePage.html>
- **Fortran 90 Reference Card**
<http://users.physik.fu-berlin.de/~goerz/blog/2008/12/fortran-90-reference-card/>
- **SOARS Fortran Reference Sheet**
http://soars.ucar.edu/documents/Fortran_Reference.pdf
- **Learn Binary the way Penguins (and old geeks) do:**
http://www.atariarchives.org/roots/chapter_2.php