Fortran 95 for Fortran 77 Programmers

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Audience, Aims & Learning Outcomes

Audience

The course is designed for scientific/engineering graduates with at least 1 years Fortran 77 programming experience or substantial experience in another high-level language (e.g., C, C++, Java).

Aims

- To introduce major features of the Fortran 95 programming language.
- To enable participants to use and gain confidence in such features.

Learning Outcomes

On successful completion of the course participants will:

- Be familiar with the layout of Fortran 95 programs.
- Be able to use the control statements `if`, `case`, `do..exit..cycle .. enddo` appropriately.
- Be able to use Fortran 95 array syntax and array functions.
- Be able to use internal, external and module sub-programs appropriately.
- Be able to take advantage of Fortran 95's dynamic memory facilities.
- Be able to set up and use simple derived types.
- Be familiar with the pointer concept as implemented in Fortran 95 and its use for data structures.
- Be familiar with the `module` for packaging constants, variables and sub-programs.

Timetable

Day 1				
9:00–9:30	-	Arrival, Coffee & Welcome	SAF/JKR	
9:30–10:00	P1	**Introduction to Fortran 90**:	JKR	
10:00–11:00	P2	**Source Form & Types**:	JKR/SAF	
11:00–11:15		Coffee		
11:15–13:00		**Source Form & Types - ctd**:	JKR/SAF	
13:00–13:45	-	LUNCH		
13:45–15:30	P3	**Arrays & Pointers**	JKR/SAF	
15:30–15:45		Coffee		
15:45–17:00		**Arrays & Pointers - ctd**	JKR/SAF	
Day 2				
9:00–10:45	P4	**Control**	SAF/VVSS	
10:45–11:00		Coffee		
10:00–13:00	P5	**Subprograms & Modules**	SAF/VVSS	
13:00–13:45	-	LUNCH		
13:45–15:30	P6	**Array Features**	VVSS/SAF	
15:30–15:45		Coffee		
15:45–17:00		**Array Features - ctd**	VVSS/SAF	
Day 3				
9:00–10:45	P7	**Derived Types & Generic Interfaces**	JKR/SAF	
10:45–11:00		Coffee		
11:00–13:00	P8	**Pointers & Data Structures**	JKR/SAF	
13:00–13:45	-	LUNCH		
13:45–15:00		**Pointers & Data Structures - ctd**	JKR/SAF	
15:00–15:15		Coffee		
15:15–16:00	P9	**Allocatable Array Extensions**	JKR/SAF	
16:00–16:30	P10	**Fortran 2003, Fortran 2008**	JKR	
16:30–16:45		Discussion & Feedback		

Course Staff

SAF	Dr Shaun Forth	AMSC Cranfield University
VVSSS	Dr Venkat Sastry	AMSC Cranfield University
JKR	Prof John Reid	RAL

Detailed Syllabus

The detailed contents of each lecture are specified by reference to the appropriate section of *'Fortran 95/2003 explained'* by Michael Metcalf, John Reid and Malcolm Cohen, denoted MR&C.

		MR&C section
P1	**Introduction to Fortran 95**	1
P2	**Source Form & Types**	2.1-2.9,3.5,7.2*,7.4*-7.5*,8.1.2, 8.7.1-8.7.2,(9.11),9.13.2
P3	**Arrays & Pointers**	2.10-2.13,3.10-3.12,6.13-6.17
P4	**Control**	4
P5	**Subprograms & Modules**	5.1-5.6,5.7^{+},5.8-5.11,(5.12,5.13), 5.14,5.15,(5.16,5.17,5.19)
P6	**Array Features**	6.1-6.8,6.13,8.10-8.12, (8.13-8.14)
P7	**Derived Types & Generic Interfaces**	3.8-3.9,5.18,6.9-6.12,9.3
P8	**Pointers & Data Structures**	5.7.1-5.7.3,7.11
P9	**Allocatable Array Extensions**	12
P10	**Fortran 2000, Fortran 2008**	11*-20*

* indicates presented without detail. $^{+}$ indicates no presentation of subsections. () indicates presented in practical material only

Teaching, Resources & Computer Codes

Teaching & Resources

Teaching will be via short lectures communicating key parts of the Fortran 95 language reinforced in computer practicals. The material of the computer practicals will be coherently presented via a course intranet site.

All participants will receive:

- A copy of the authoritative textbook *'Fortran 95/2003 explained'* by Michael Metcalf, John Reid & Malcolm Cohen.
- A course folder containing copies of all presented slides and computer practical instructions.

Computer Codes

Participants are encouraged to bring along their own codes, or parts of codes, particularly if they have specific questions about the Fortran 95 implementation.