Introduction to the course: 3C59 "Scientific Computing using Object Oriented languages"

In this introduction we will cover:

- **Aims of the course**
- **Assumed prior knowledge**
- **Format**
- **Overview of course content.**
- **Assessment**
- **People**
- **Books**

1 Aims of the course

The aim of this course is to give the student an introduction to the use of object oriented programming in the context of physics data handling and analysis situations .

Implementation is mainly in C++. Through this course the student should learn enough to be able to design and implement simple analysis programs such as would arise in 3rd year laboratories and 3rd and 4th year project work.

In addition the course also aims to give an introduction to the use of Java if time permits.

Paraphrased:

The fundamental intellectual aim is to give you an understanding of the philosophy of object oriented programming.

- **You need to know OO**
- **the norm in the commercial world**
- **now pervading science research as well**

The fundamental practical aim is to give you "hands on" experimence of using C++ to realise OO programming.

- **C++ is still the most common language appearing in job adverts**

We keep it all firmly embedded in the context of:

"programming needed to do science"

If time permits we will also show you some OO realisation in Java

- **Already very important. Arguably more important than C++**

2. Assumed prior knowledge

You are assumed to be familiar with computers in general, i.e.

- **PCs**
- **Logging on**
- **Use of windows applications**
- **Email**
- **WWW browsers**

You are assumed to have some prior exposure to a procedural programming language: i.e. FORTAN, BASIC or C

Specifically you are asusmed to have at least met the concepts of:

- **Inbuild data types (integer, real, ...)**
- **Arithmetic manipulations on variables (i.e a*b or x = m*x + c)**

Note: we do not expect you to remember the detailed syntax, only the general ideas of variables used in a procedural programming language.

It would be useful, but not essential, if you have some idea of what the terms

- **compiling**
- **linking**

mean in the context of programming.

It would also be useful, but not essential, if you have some experience of the use of a visual development environment with any programming language, I.e.

- **Microsoft Visual xxx**
- **Salford xxx**
- **Symantec visual café**
- **..other..**

ANY QUESTIONS AT THIS POINT ?

3. Format

Two 2/3 hour "hands on" teaching sessions per week in a cluster room

Typically 30 mins of lecture followed by 30 mins of programming exercise practice.

(..however...exact split may vary.....)

During teaching session there will be two or three people circulating to help.

You are encouraged to talk to your neighbour about the exercises

Sessions:

There is only 1 course in 2001/02

It is ALL DAY Monday, i.e

9.30 – 12.30

14.15 – 17.15

The course consists of

MODULES

TESTS

CONSOLIDATION EXCERCISES

All lecture material will be projected as

PowerPoint slides

and is also available to you on WWW at:

http://www.hep.ucl.ac.uk/~clarke/OOCourse/index.htm

We will attempt to produce printable (black and white) PDF files.

All programming examples are distributed on WWW

All tests will be submitted
(i) electronically by email
(ii) also on floppy disk

Please ALWAYS bring a formatted floppy disk with you !!!!!!

If we have to use a piece of paper in this course it will be an administrative failure !!!!

Each module has a theme, and will be framed with an introduction and summary which tells you what you are expected to know following the module

Within the module there are:

- **Instructional lecture slides**

- **Private study work which students must do in their own time, and which will be ASSUMED for following sessions.**

- **Programming exercises which will often be started during sessions, and MUST ALWAYS be completed in private study time.**

$\Rightarrow$ the exercises will be used in subsequent exercises and tests !

The course environment will be

Microsoft Visual C++

Running through WTS on the college cluster syste,

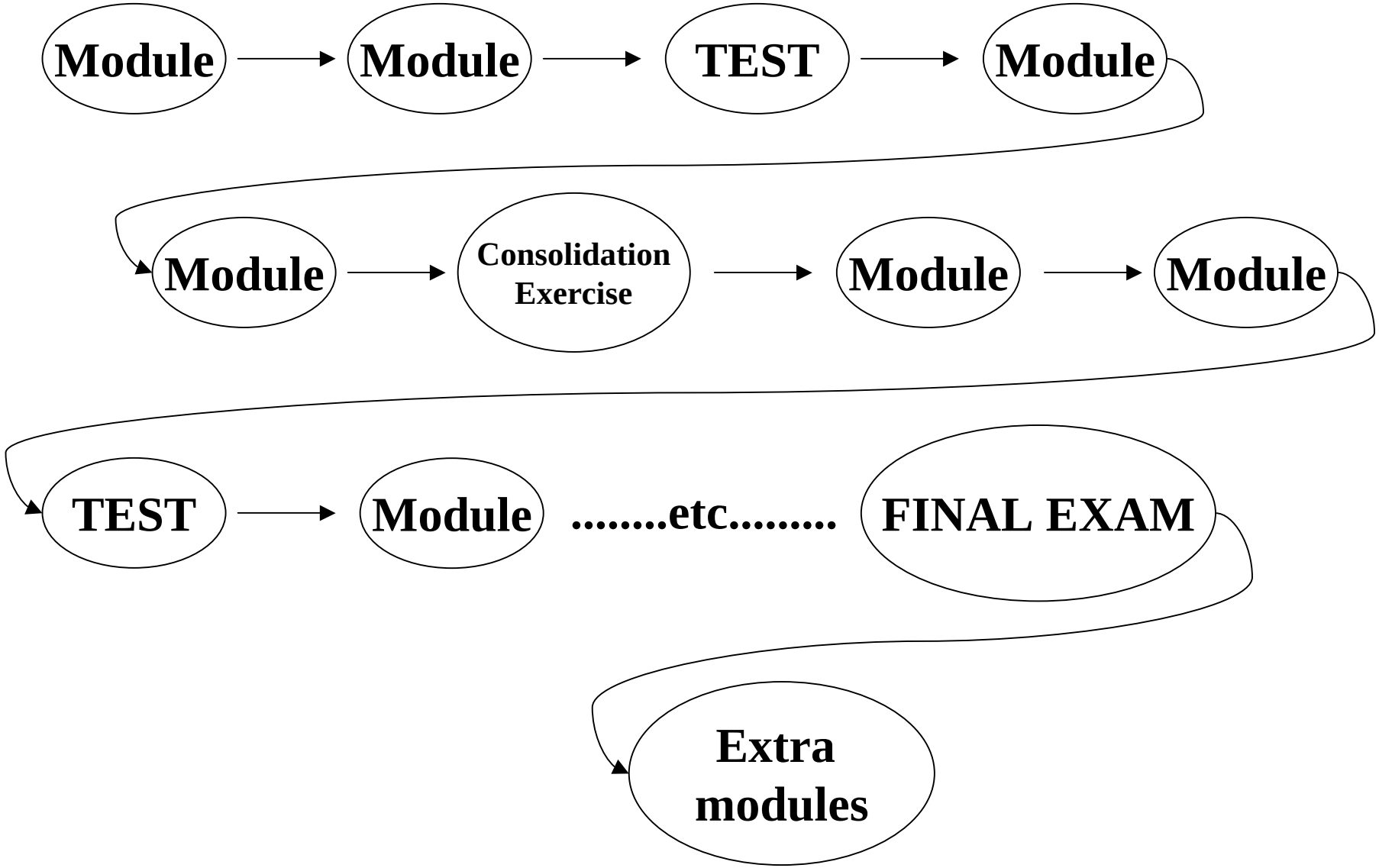
Students may discuss with me regarding use of laptops or other environment

BUT it is the students responsibility to ensure that they know how to use the the course environment such that they may use this for the examination

In no circumstances will failure of students private equipment be acceptable as a reason for failing to submit work, or do coursework

It is your responsibility to make sure you can use the official system at the "drop of a hat"

The format will be typically:



4. Overview of course content

There is (or at least will be) a document on the Web which summarises the purpose and content of each module. This document is kept up to date as the course evolves.

LOOK AT DOCUMENT ON WWW NOW

5. Assessment

The course will be assessed entirely "online". There is no written exam.

You will undertake two TESTS during the teaching sessions.

These count for approximately 40% / 60% respectively of the total course mark each

All of these take place during timetabled course sessions.

You MUST be present for them. The assessments cannot be done at any other time unless there is an exceptional reason (failing to turn up for the session in question does not count !)

TESTS

There will be two TESTS through the course.

You will do these during a session in the cluster room.

???? am or pm ?????? clashes ???

You will then submit what you have done by EMAIL abd DISK BEFORE leaving the room.

The currently foreseen dates for the tests are

(i) ??????
(ii) The very last session of term – pm if possible ???

These are NOT guaranteed, and we may have to vary for good reason.
If they are changed then this will be advertised on WWW during the previous week, and during the preceding session.

It is YOUR RESPONSIBILITY to be aware of when the TESTS are. I.e if you do not know because you have not turned up to a session then you will fail the test.

A student who attends all sessions will not have any problem in this respect.

Let me emphasise this:

I will attempt to give you ample warning of test dates.

I will put them on the WEB as well as advertising in the lectures

However you are EXPECTED to be present at each session, and therefore in no circumstance will failing to turn up for a TEST because you were unaware of the date be accepted as a reasonable excuse.

6. People

The principal course lecturer is:

Peter Clarke clarke@hep.ucl.ac.uk

The co-lecturer and administrator is

Ben West bjw@hep.ucl.ac.uk
room D106 on main Physics level D (next to Physics Cluster room)

The course demonstrators are:

Paul Crosby	**pac@hep.ucl.ac.uk**
Yee Li	**ytl@hep.ucl.ac.uk**

We are all rather "open door" regarding help at any time (if you can find us) but please bear in mind that as we are staying behind for surgery each week, then you must try to use that time first. In other words we may be less than willing to give up other time to answer questions which could have been asked during scheduled teaching sessions or surgery.

Conversely we will always make time for honest students who ask questions in scheduled times, and still want help at other times.

7. Books

Professor Davis has copies of Lippman for sale at a substantial discount.

Course book:

C++ Primer
Lippman and Lajoie (third edition)
Addison Wesley
ISBN: 0-201-82470-1

BIBLE of C++

The C++ programming language (third edition)
B.Stroustrup
Addison Wesley
ISBN: 0-201-88954-4

(but this book is difficult for novice to read)

The STANDARD Template Library

http://www.sgi.com/Technology/STL/stl_index.html

The C++ Standard Library
Josuttis
ISBN: 0-201-37926-0

A good "engineering" book

Scientific and Engineering C++
J.Barton & L.Nackman
Addison Wesley
ISBN: 0-201-53393-6

- Now do attendance list
- Use spreadsheet from Dr.Moores
- Request emails (with names !)