Scientific Programming in Java

Introductory Talk (Part 1)

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Aim of Course

The aim of this course is to teach the basics of Scientific Programming using Java in the Unix environment.
The course is taught on-line with a series of computer examples and self paced checkpoints

Counts 10% towards Physics 2A

Timing

- **Weeks 2-7 (inclusive) of Semester 1.**

- **31 Seat Computational Physics Laboratory (3203) plus 25 seat Microlab (3212 or Mon/Thursday, 3210 on Wednesday).**

- **Each Student booked into one 3 hour session per week (2-5pm) [Monday / Wednesday or Thursday]**

- **Attendance in compulsory (being monitored).**

- **Monday Group: Monday 24 Oct is a holiday, you will need make-up time on another day.**

Computational Laboratory + Microlab available on "open-access" outwith these times.

Staff Involved

- **Course Organiser:** Dr WJ Hossack, Room 4209. Email: w.hossack@ed.ac.uk

- **Laboratory Administrator:** Mrs E McIvor, Room 3203, Email: e.mcivor@ed.ac.uk

Demonstrators:

Monday	Wednesday	Thursday
Dr Will Hossack	Dr Philippe Monthoux	Rob Tweedie
Andrew Lafong	Russell Sommerford	David Skulina
Iain Robinson	Alastair Braden	David Roseburgh
Chris Mountford	Douglas Robertson	Rupert Nash

The Checkpoints

6 Checkpoints (5 compulsory 1 optional)

1) **Address Program:** Extension of "Hello World" (5%)

2) **Variables and Arithmetic:** Basic input/output and arithmetic. (10%)

3) **Roots of Quadratic:** Calculate roots of a quadratic equation. (20%)

4) **Damped SMH:** Calculate amplitude of damped SMH and display graphically. (30%)

5) **Dice Simulation:** Simulation of "fair" and "unfair" dice. (35%)

6) **Monte-Carlo simulation** to calculate π and volume of a water molecule. (35% option for experienced programmers)

Full details in Yellow course booklet

Checkpoint Deadlines

There are two checkpoint deadlines:

- **Checkpoints 1-3: 5.00pm Thursday 20th October**
- **Checkpoints 4-6: 5.00pm Thursday 3rd November**

Checkpoint submitted after these dates
WILL NOT count
towards the assessment of this course

Assessment

Checkpoints assessed by the Demonstrators, first three on a 3 point scale, second three on a 5 point scale. Grading will take into account:

- **Function of the Code (does it work!!!)**
- **Structure and layout (including comments)**
- **Understanding of the task and ability to answer question on the code**

Novice programmer attempt checkpoints 1-5
Experienced programmers attempt checkpoints 4-6

Anybody going on to take Computer Simulation 2 next term is "Strongly Advised" to attempt Checkpoint 6

Needed for

- **Computational Methods:** Compulsory third year course that build on this one.

- **Computer Simulation 2:** Optional course next term.

- **Honours Computational Courses:** Two optional computer simulation courses.

- **Fourth Year Projects:** Many computer based projects.

- **Mphys Projects:** All Mphys project involve some degree of computing.

All physicists, engineers, geophysicists, chemical physicists **will** use computing in future jobs.

Take this course **seriously**, you will need the skills

On-Line Material

Course "Home Page" at

http://www.ed.ac.uk/~wjh/teaching/Scientific-Programming/

This contains

- **All course documentation**
- **Example programs**
- **Links to other internal and external courses.**
- **Links to Java and Unix resources**
- **Feedback Questionnaire**

Please complete the (short) questionnaire on your LAST DAY

Mailed to me anonymously

Use of Time

- You **should** be able to complete the course in the allocated time.

- The Demonstrators **have other students to deal with.** So try and fix problems yourself before calling a demonstrator.

- Laboratory is available outwith your booked period, but do not spend too much time.

- Get Checkpoints "checked off" **as soon as you complete them.** The final session(s) are very busy.

- Small number of students find computing "addictive". You are here to study physics, not to play with computers!

Collaboration

Examinable element of your Degree Programme and is covered by the Code of Student Discipline. In particular:

- **You must not submit, or attempt to submit other peoples work as your own.**
- **BUT, "Asking and receiving help from each other" is allowed and encouraged.**

If you are stuck with a piece of code asking for help from one of your friends is a good way for you both to learn.

Remember you are NOT in competition with each other, you have a common aim,

"To Learn how to Program!"

Use of Computers

Access to computer facilities are a privilege to assist you with your studies at The University of Edinburgh**. Misuse will result in these privileges being withdrawn.**

Note: You have already signed the Computer Regulations and are bound by them

- **No Games, (especially network games). These machines are used and monitored 24 hours a day.**

- **Do not download "non-free" software, music or other copyright or illegal material.**

- **Do not attempt to compromise the system of other peoples files.**

- **The account is issued to YOU. You must not permit access by any other person.**