Assignment: A presentation on topics in Computing

You are expected to discuss in some depth one of the relevant topics in Computing from those contained in the list below. One topic will be assigned to each student. At the next lecture this topic assignment will be worked out with the lecturer. You should try and choose your preferred topics before the lecture and you may even want to agree in advance with the rest of the class who does which topic, and agree such allocation with the lecture.

For each topic, some reference reading material has been indicated. This is typically (a part of) a chapter from a text book. You are encouraged to use this reading material and any useful references it may have, as a starting point for improving your understanding of the proposed topic. Further information can be obtained by using search engines, by following up further links from those provided, or by using the library (keeping in mind that your work needs to focus on the reference reading material suggested). Reading material is generally available form the library or the web.

Ultimately, you will be required to give a short talk on the topic. The timing of the talks is still to be fully organised but the talks are likely to be held between 11am and 12 noon on Thursday 4th December. Your talk will last no more than 15 minutes, including some space for questions. The talk will be judged against general presentation, technical content, understanding of the topic, clarity of presentation, timeliness, quality of the slides.

The slides for the presentation need to be prepared according to the following PowerPoint template (for which a .ppt file has been provided):

1 title slide,
1 slide for the statement of the topic or problem discussed
1 optional slide giving the background or state of the art if either is appropriate
4 technical slides (If necessary you may use 6 - but you must observe the time limit)
1 slide for conclusions/future developments
1 slide for references

You are strongly encouraged to follow the template and must respect the time limit during the presentation.

Before being admitted to give the presentation, you must discuss the presentation you intend to give with one of the lecturers, and receive a positive feedback. It is hence your responsibility to contact lecturers well in advance of the deadline so as to have time to adjust your presentation if needed. (Do not expect they will be necessarily available the day before the deadline). You should endeavour to see Dr Ochoa (items 1, 2, 7) or Professor Magill (item 4) or Dr Bracciali (other items) before November 27th. You need to show (a draft of) the slides that you will present.

Please note that the presentation should be in your own words and should reflect your own understanding of the subject. Where material has been derived from another source, this should be clearly indicated and the original source should be cited. References to articles should be given within your presentation in a form such as [1] and a list of all references used must be given at the end of the presentation in the bibliography in the following manner:


If you directly quote from an article, make this clear by using inverted commas or putting the quote in an indented paragraph on its own. You must also give a reference to the source of the quote.
The assignment is due on Thursday 4th December 2014. The assignment counts for 40% of the total course mark. You will be required to give a presentation and to hand in a paper copy of the slides you use in your presentation. In order to obtain a grade for the course you must submit and present an attempt by the deadline. This rule may be relaxed for students who can show good cause (see late submission below).

We recommend that you place the paper copy of your slides in a clear plastic A4 pocket clearly labelled with your registration number. Do not write your name anywhere on your submission. You should hand in your presentation just before you give the talk.

Plagiarism
Work which is submitted for assessment must be your own work. All students should note that the University has a formal policy on plagiarism. Plagiarism means presenting the work of others as though it were your own. The University takes a very serious view of plagiarism, and the penalties can be severe. The University formal policy on plagiarism can be found at: http://www.stir.ac.uk/academicpolicy/handbook/assessmentincludingacademicmisconduct/.

Specific guidance in relation to Computing Science assignments may be found in the Computing Science Postgraduate Student Handbook.

We check submissions carefully for evidence of plagiarism, and pursue those cases we find. Several students received penalties on their work for plagiarism over the last years. Penalties range from a reduced grade, through a 0 grade for the module, to being required to withdraw from studies.

Late submission
If you cannot meet the assignment hand in deadline and have good cause, please see one of the lectures to explain your situation and ask for an extension. Late coursework will be accepted up to seven calendar days after the submission date (or expiry of any agreed extension) but the grade will be lowered by three marks per day or part thereof. After seven days the piece of work will be deemed a non-submission, and will be given a mark of 0 (zero) and the student will be deemed to have failed the module, due to failure to comply with published requirements.

List of Topics:

1. Software Life Cycle and Development Models
   I. Sommerville. Software Engineering. 7th ed.
   Chapter 4 (Sections 4.1, 4.2 and 4.3). An overview on software development.

2. Software Project Planning
   I. Sommerville. Software Engineering. 7th ed.
   Chapter 5. On overview on various aspects of software project management. (or possibly a general introduction and a focus on one relevant aspect, e.g. Risk Management).

3. (Array) Sorting Algorithms
   N. Wirth, Algorithms + Data Structures = Programs
   Chapter 2 (2.1 and 2.2) Limitedly to Insertion Sort, Selection Sort, and Quick Sort (Maths details related to complexity of Algorithms can be skipped, as far as complexities are clearly indicated and an intuitive justification of them provided).
4. BCS Code of Good Practice

Available at www.bcs.org/upload/pdf/cop.pdf This is a detailed list of good practices from the British Computer Society. (It is important to explain the scope of the document, its structure and the main items therein contained).

5. The Structure of Operating Systems

Chapter 3 (3.1, 3.2, 3.3, 3.5_optional, 3.6) An overview on the main aspects of OSs.

6. On Programming Languages

Brooks. Computer Science, an overview 8th edition, Addison Wesley
Chapter 6 (6.1, 6.2, 6.3, plus optionally others if of interest) An overview on the main concepts and structures of programming languages, with a focus on imperative languages.

7. Software Effort Estimation

Chapter 5 On estimating software costs, with a focus on some of the used techniques.

8. Twos Complement and Excess Notations

Brooks. Computer Science, an overview 8th edition, Addison Wesley
Chapter 1 (1.6) Produce an explanation of excess notation and its uses. In particular, provide a description of two's complement and its mathematical operation. Consider any overflow situations.

9. Logic Operations

Brooks. Computer Science, an overview 8th edition, Addison Wesley
Chapter 2 (2.4) Produce an explanation of logic operations. Ensure you include the rotational and shift variants. Provide examples of why such operations are useful.

10. Architectures

Brooks. Computer Science, an overview 8th edition, Addison Wesley
Chapter 2 (2.6 but also aspects of 2.5 and indeed 2.3) In class we described a traditional von Neumann architecture. Describe more modern advances employing pipelining and multiprocessor machines. Explain how these changes can provide a better performance.

11. Binary Representations of Sound and Images

Brooks. Computer Science, an overview 8th edition, Addison Wesley
Chapter 1 (1.4) Describe some straightforward approaches to using binary to represent sound and images.

12. Memory Management

Chapter 9 (9.4, 9.4.1, and some of 9.4.2) Describe a “walkthrough” of memory management and the operation of the MMU. Use an example to show it operating for both instructions and data. Do not give a general explanation; rather use a particular example and show the operation step by step.

13. Buses

Chapter 3 (3.4 & 3.6) Describe the characteristics of buses used in a modern desktop PC. Describe the operation of one standard in some detail.