Coursework Submission Requirements

These requirements apply to both courseworks.

1. Your coursework should be uploaded to the VLE before the deadline as a file in `.pdf` (or `.docx`, `.doc`, `.tex`, or `.txt`).
2. You should monitor and report the time you have spent for each question of the coursework, and leave a note to the marker if you need to raise any issue at the beginning of your coursework as follows:

Total Number of Hours Spent	
Hours Spent for Question 1	
Hours Spent for Question 2	
Hours Spent for Question 3	
Hours Spent for Question 4	
Note for the marker (if any):	

3. Your answers or solutions in each coursework should be clearly labelled adopting the question order as well as the question numbers in the given coursework.
4. All the questions should be attempted. If you skip any question, however, you should still include the question number and answer "No attempt" in your coursework.

   For example, if you have attempted only the first part of question 3 consisting of three parts (a–c) in a coursework consisting of four questions (1–4). You should write:

   ```
   1. No attempt
   2. No attempt
   3.(a) Answers
         ⋮
     (b) No attempt
     (c) No attempt
   4. No attempt.
   ```

5. Show *all* your work.

You may lose marks otherwise.

CO1110 Introduction to Computing and the Internet 2012–13
Coursework I: Memory, CPU, Data Representations and Operating Systems

There are 100 marks available for this assignment.

1. Consider the following descriptions of some basic hardware elements or devices in a conventional computer system. Name each of the hardware elements, and find out (if possible) the model of that element that is used in your own computer system. Draw a block diagram to show how these basic hardware devices communicate with each other. By block diagram, we mean a diagram in which principal parts or functions are represented in blocks (e.g. $\boxed{\text{A}}$, $\boxed{\text{B}}$) and the links (directed or undirected lines) between any two blocks represent certain predefined relationships between them (e.g. $\boxed{\text{A}} \longrightarrow \boxed{\text{B}}$). [25]
An element or device that

   (a) is responsible for conversion of the data format that is suitable for human communication to a format that is acceptable for the computer.
   (b) converts the information back from a computer oriented representation to what is suitable for humans.
   (c) is the main resource which holds both the programs and data.
   (d) fetches instructions from main storage, interprets them and issues the necessary instructions to various parts of the computer system.
   (e) conducts arithmetic and logical computation.

2. Convert step by step the following bit pattern in IEEE 754 into a normal decimal number. Show all your work. [25]

Sign	Exponent	Significand
1	1000 0000	1000 0000 0000 0000 0000 000

3. Represent the negative decimal number -1.26 using IEEE754 single precision format. Show all your work. [25]

4. An operating system may maintain a number of queues such as the long-term, short-term, intermediate and I/O queue. Suppose a particular process $\mathcal{P}$ only involves one I/O operation. Consider as follows a collection of possible actions that the operating system might perform to handle process $\mathcal{P}$. Re-arrange the actions in chronological order to demonstrate what should happen from the time when the process $\mathcal{P}$ is created, until $\mathcal{P}$ is completed. [25]

   (a) $\mathcal{P}$ is moved to the intermediate queue which resides on some disk.
   (b) $\mathcal{P}$ submits to the operation system and the operating system includes $\mathcal{P}$ in the job queue.
   (c) The intermediate scheduler swaps $\mathcal{P}$ (back) into main memory.
   (d) The short term scheduler selects $\mathcal{P}$ for the CPU to execute.
   (e) The short term scheduler moves $\mathcal{P}$ from the ready queue to the I/O queue of the relevant I/O device when the CPU encounters the instruction about I/O in $\mathcal{P}$.
   (f) The long term scheduler moves $\mathcal{P}$ to the ready queue if the resources are ready.
   (g) The I/O module sends an interrupt request to the CPU (when the I/O operation is completed).
   (h) The short term scheduler moves $\mathcal{P}$ (back) to the ready queue from the I/O queue.
   (i) The intermediate scheduler swaps $\mathcal{P}$ out of the main memory in order to create some space for other processes while $\mathcal{P}$ is in the I/O queue.
   (j) The operating system deletes $\mathcal{P}$ from all queues.

   Your answer should include at least a sequence of action numbers to show the chronological order of the actions. For example, your answer may start with a table as follows:

chronological order	1	2	3	$\cdots$
action number	(d)	(b)	(e)	$\cdots$

   This should be followed by a discussion on how the operating system handles $\mathcal{P}$ in terms of the queues and the relevant schedulers. You may also extend or adjust your conclusion.

CO1110 Introduction to Computing and the Internet 2012–13
Coursework II: Computer Networks, WWW and Legal Framework

There are 100 marks available for this assignment.

1. Explain with a suitable diagram the use of headers in routing protocols under the TCP/IP model. Give an example where two computers A and B wish to establish a communication. What essential steps do they need to take under the TCP/IP model? Show step by step how headers can be implemented and useful for routing. Add details of assumptions in your discussion if necessary. [25]

2. Consider the class-based IP addressing scheme. Explain how the following network addresses can be used to identify a particular network. Discuss the advantages and disadvantages of the class-based IP addressing. [25]

   (a) 18.7.22.83:80;
   (b) 172.20.149.22:143.

   Your solutions should include all your work, and certain details, further assumptions and related topics if appropriate, such as the binary version of address and mask, boolean AND mask/address, address class or network address, subnet address, host, and application.

3. Help Carol with the development proposal of a suitable webpage for the BSc course "Introduction to Computing". [25]

   > (Scenario) Carol, a new educational manager would like to know what would be, from the students' point of view, the most important features of the new level-one BSc course webpage "Introduction to Computing". Your task is to advise Carol and influence her decisions on what to request in her proposal to the university.

   As you are not yet an expert in webpage development, you may decide that the best you can do is probably to 'learn on the job'. For example, you may first study and comment on three of your favourite webpages in Computing. You may then summarise your comments in a table, and even design a few prototypes of the imaginative new webpages to demonstrate your ideas to Carol. To be helpful, your comments should be clearly presented to include (but not limited to) the following:

   (a) A summary of your comments in a table similar to the one below with an explanation (no more than 500 words), and provide the full addresses of the three favourite webpages with your access dates.

	favourite webpage 1	favourite webpage 2	favourite webpage 3
favourite feature 1			
favourite feature 2			
favourite feature 3			

   (b) Three screen shots of your prototypes with a full design process
   (c) A short cover letter (up to 200 words) to Carol to highlight all your work above.

4. Write a short essay (up to 1000 words) on comparative studies of current policies on academic plagiarism. Academic Plagiarism is a serious offence. What are your experience, knowledge and views about the seriousness of the offence? What are the legal rights of the original authors and the plagiarists? What would be a good policy on plagiarism in your opinion?
   Conduct research on and compare the policies on academic plagiarism in three academic journals in Computing. Focus on one aspect of the many issues on academic plagiarism. For example, you may focus on how well each of the policies protects the copyrights of the original authors, or how effectively the policies punish the plagiarists, or on the differences in approach or ambiguousness of the policies.
   Good conclusions can only be drawn based on facts. You should therefore pay attention to adequate details of factual data, and make sure that you present sufficient factual data in your essay. You should also use tables, figures and quotations to support your arguments, and include correct references. [25]