

# McMaster Chemical Engineering (McChem Inc.)

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**To:** Colleagues in Chemical Engineering 4N04  
**cc:** Alicia Pascall, Yasser Ghobara  
**Date:** 12 November 2012  
**From:** Kevin Dunn  
**Subject:** Final details on the self-directed learning project

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## Final memo

The term is rapidly coming to an end, with only 3 weeks of classes left before exams start. By now you are all used to this cycle, having experienced it several times already. But the final year is different, because the projects and reports you are working on in 4N4 and other courses are more comprehensive and larger in scope than you have ever had before. Your working hours are longer and more intense. Personally, I can recall only a handful of times that I have been more stressed, more engaged and working longer hours than in my final year of university. It is an experience that no one seems to forget. And it will repeat itself next semester, only then you will have Kipling and other end-of-year activities as well.

I am being honest, though you may not believe me when I say it, but this is not something that your final year instructors plan for you: it simply happens due to the nature of the courses. So time management, together with healthy eating and sleeping habits are critical during this period.

With that parenthetical advice out of the way, this final memo then gives some guidance on the report expectations.

## SDL project report

The final project report is not to exceed 30 pages and due to time limitations we will not grade past the 30th page. More details in bullet point form follow, which you should use as a checklist before submitting your project:

- A single page cover letter (please, no cover page) should be provided as your first page.
- All group member names and group number appear in the cover letter.
- A table of contents is not required.
- The report must be submitted electronically, no paper copies will be accepted.
- The report should preferably be a native Google Document, shared with full editing permissions. Alternatively, a shared Word document or PDF will be accepted without penalty, but do not expect any electronic feedback on these 2 types of documents. In fact in previous years, groups received no feedback ever, so we are trying our best to supply feedback, and the only way we can do that effectively and easily is with a Google Documents submission.
- Do not use a font smaller than 11 points; single line spacing is preferred.
- Page borders should be 1 inch, on 8.5 by 11 inch paper. These are the default settings in Google Docs.
- Pasted figures from other sources, e.g. P&IDs must be of high resolution. Low quality figures (if uncertain, please redraw the figure), and figures without attribution will be **heavily penalized**.
- Figures must be numbered sequentially. Pages must be numbered.
- Pages may be switched to landscape orientation if it assists in the display of wide tables.

- We prefer not to have any appendices. Supply the necessary data and information in line. The reason becomes clear if you think about how one reads an electronic document: it is not easy to flip forward/backward in pages. Referring the reader to an appendix only for them to come back is clumsy. If the reader isn't going to refer to the material, then s/he will just scroll past it.
- It is clear from the previous point that you will have to decide what your group deems important. Follow these rules: if you expect the reader will require the information, e.g. to allocate grades effectively, then leave the information in. Similarly, pages of repeated details are unnecessary: if you can do it once well, we assume you can repeatedly do it well.
- The P&ID should have the level of detail as in assignment 7 only for the unit(s) where you perform your hazard and operability study. The rest of the flowsheet can be a basic block diagram with the control systems shown.
- Pages 1 to 30 will start with the cover page and end with the references.
- A **mandatory 31st page is required**, and will be a detailed table with two columns. The first column will show each group member's name. The second column will be a bullet-point list of the sections that the person significantly contributed to (e.g. "4.1.2 Capital cost estimation of major units"). A significant contribution is where that person wrote the section or co-authored it. Editing and minor changes are not considered as significant. Other contributions from that person may however be listed (e.g. "Document compiler", or "Overall document editor").
- The relative weighting of the report to each of the major sections is left to your discretion and should be in proportion to the complexity and nature of your selected flowsheet.

Some other miscellaneous notes:

- The optional troubleshooting section, if included, is part of your 30 page limit.
- A sensitivity analysis is required in your economics section.
- In the capital cost estimations, show the calculations for at least 3 "complicated" units, while the remaining units can be simply calculated without showing the details. Always report the cost estimate's range and source of information though.

## Meetings

Meetings with your managers, Kevin or Alicia, to address any concerns and questions may be scheduled in the coming weeks. However, please provide an agenda and expected meeting duration at least 12 working hours in advance of the meeting time. Do not expect to schedule a meeting just before the report due date or presentation date.

## Presentations to the class

Please refer to the previous SDL memo regarding this topic.

## Grading

The grading was described in the previous SDL memo. There is one additional aspect that you must be aware of. As this project is performed outside of class, the instructor is not able to observe your work. Therefore, you have essential information regarding the individual contribution by everyone in your group. We will employ a method similar to that developed by Dr. Felder of the famous "Felder and Rousseau" textbook (Kaufman, Felder, and Fuller, *Journal of Engineering Education*, April 2000, 133-140), described below.

Every student must provide a confidential peer evaluation of all other members in his/her group. This evaluation will be completed electronically. Each student will have his/her grade modified by the following formula for the project.

$$\text{Student grade} = \text{Group project grade} \times \sqrt{\frac{\text{Student individual average score}}{\text{Group average score}}}$$

The individual student average score will be calculated using the scores submitted by all group members except the student being graded, i.e., self evaluations will not be used in grading. A change of more than one letter grade will be reviewed and can be limited to one letter grade by the instructor.

- We expect that you will provide your honest opinions, as soon-to-be professional engineers.
- This is not a popularity contest; you should treat close friends the same as other classmates.

Please discuss questions about this with Kevin.

## Final assignments

There is a troubleshooting assignment on 19 November (handed-in during the tutorial period).

After that, there will be one more piece of work due, which is an individually written, one or two page **course reflection**.

Part of successful self-directed learning is a final step where you reflect on your learning and progress. Pause for a moment and think about the progress you have made and compare it with your goals and expectations for this course. You should not feel compelled to be positive about your experiences (although we hope that a few bright spots exist); please be honest. Also, this is an individual assignment and should reflect your individual views.

In the reflection please think about the learning opportunities during the course. They include

- Group work
- Chairperson tasks
- Life-long learning (economics and process operability)
- New aspects of problem solving (HAZOP and trouble shooting)
- More responsibility distributed to you in project definition and completion

You might think of mentioning other issues that were especially important (or especially unimportant/unhelpful) to you.

We would like you to write an honest reflection on your experiences in the course. We would like you to address as many learning experiences as you wish, as long as you are sure to discuss the topics listed above. We would like you to consider **how you have changed (or not)** as a result of these experiences.

The purpose is not necessarily an evaluation of the course; we have the standard forms for course evaluation. However, if some positive or negative issue arises about the course design or delivery, you can include this in your reflection. Please be specific in your comments, and note that suggestions for improvement for future years are gratefully accepted. Please know that you will not be penalized for any negative comments, however, if you feel your comments might be extreme in some way, please provide these via the [anonymous course website feedback form](#). Over 120 comments have been received this way during the term, which have hopefully made this course more enjoyable and worthwhile to you.

Finally, let me end this memo by thanking you, and your groups, for the enthusiasm, challenging questions and interaction during this course. For those of you who I don't see in 4C3 in 2013, allow me to formally wish you all the best with your professional career. Let me know how things are going.

Sincerely,

Kevin Dunn