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# MEC723: Mechanical Systems Design

This is the home page for design-related materials by [Dr. Salustri](#) for MEC723. You should bookmark this page for easier access.

Announcements and other information will be made available through [D2L](#).

## Instructor

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## See also

- [mec723-f21-01@ryerson.ca](mailto:mec723-f21-01@ryerson.ca) for course-related discussions.
- [Using Salustri's PTI](#).
- [Salustri's grading policy](#).
- [Personal productivity for students](#): a collection of tips to help students manage your work.
- [Zoom keyboard shortcuts](#).

I do not carry such information in my mind since it is readily available in books. The value of a college education is not the learning of many facts but the training of the mind to think.*Albert Einstein, 1879-1955*

Education is what survives when what has been learnt has been forgotten.*B.F. Skinner, 1904-1990*

I am not different from you. I am different *like* you.*unknown*

## Schedule

**Lectures:** Wednesdays 14:00-16:00 via Zoom

**Labs:** Wednesdays 16:00-18:00 via Zoom

**TA:** [Behrad Ghazinouri](#)

## About Privacy & Online Courses

Lectures will be recorded and posted online via D2L for the benefit of all students.

Anything presented and anyone speaking will be captured in the recording. If a student does not want their voice or likeness captured, they should turn off their camera and microphone. While participation (asking and answering questions, providing commentary, etc.) in class is encouraged - as it would be in conventional lectures, such participation is *not* a course

requirement.

Sensitive personal information should not be discussed or shown during the recording of lectures.

Student identification should not be displayed to other students.

A chat log, including private messages, is captured as part of the recording. The chat log will be kept on a secure server.

Zoom lecture **registration, authentication, and passwords** are all used to deter interlopers and zoom-bombers.

Recordings of lectures, including interactions with students, will be made available ASAP after a given lecture via D2L. Those recordings will be stored securely and deleted within one year of the end of the course.

Email instructors if you have any questions.

## Lecture Material

Most lecture material is based on the [design part of my wiki](#). Where there are no slides, one can expect a review of the relevant materials as indicated in the Weekly Schedule.

During in-class workshops (as of Week 3), students will be expected to take notes collaboratively in shared Google Docs. Links to individual documents are listed below. The Google Docs for student notes are all in the shared folder [In-Class Workshop Student Notes](#).

WEEK	PREPARATION	LECTURE
1	None	Admin What the !@\$ is design?
2	Review <a href="#">systems</a> and <a href="#">complexity analysis</a>	<a href="#">Systems Review Workshop</a> <a href="#">Complexity Analysis Workshop</a>
3	Review <a href="#">Problem Analysis</a>	<a href="#">Problem Analysis Workshop</a>
4	Review <a href="#">Problem Analysis</a>	<a href="#">Problem Analysis Workshop</a>
5	Review <a href="#">Failure Mode and Effect Analysis</a> Review <a href="#">TRIZ</a>	<a href="#">FMEA Workshop</a> <a href="#">TRIZ Workshop</a>
6 & 7	Review <a href="#">product system, subsystem, and system interface</a>	<a href="#">System Workshop 1</a> <a href="#">System Workshop 2</a>
8	Review <a href="#">concept design &amp; creativity methods</a>	<a href="#">Creativity Methods Workshop</a>
9	Review <a href="#">concept design</a>	<a href="#">Concept Design Workshop</a>
10	Review <a href="#">concept design</a>	<a href="#">Concept Design Workshop</a>
11	Review <a href="#">detailing a design</a>	<a href="#">Detailed Design Workshop</a>
12	Reports & Presentations	<a href="#">Reports &amp; Presentations</a>

[Slack](#) can be a great tool to help coordinate projects. [This](#) is an anonymized dump of an entire semester of Slack for a MEC723 project involving the whole class. It's interesting to consider how communications happened and what the major topics of conversation were.

## What students have said

Below are comments from actual students about this course, drawn from comments submitted with the Faculty Course Survey some time since I arrived at Ryerson in 1999. I have provided commentary as required.

Student comments are verbatim as provided by the students, in boxes; instructor remarks are in plain text below each box.

The large group project gave me a unique learning experience in terms of working in such a large team. Personally, I led a lot of the meetings which was an interesting and new experience as usually, the teams are significantly smaller. If a few things on the design roadmap could have a section catered to the 723 course rather than just working from the 325 version as sometimes it's difficult to scale up to 20 people without making the section crazy long. I definitely enjoyed the 723 course more than 325 it seemed more relaxed and ran much smoother. A potential suggestion for the following years is for the class to decide from a list at the start what they want to design during the workshops.

Thanks for a number of great ideas. I will try to implement as many of them as I can, as quickly as possible. The biggest problem I face is that enrolment in MEC723 is highly variable, and it can be hard to adapt every part of the course to the actual size of a given year's cohort - short of developing a number of alternative courses and then deploying the one best suited to a particular group. Unfortunately, the workload involved in that is... prohibitive. Still, I'll keep looking for better ways to run MEC723.

Although the lab and project marks can be quite strict, you respect the reason why this professor and his TA teach to such a high degree of detail and correct ideation. He understands that a spoken thought can have multiple interpretations, and goes out of his way to convey a concise concept when explaining in lecture. People often forget that students are people too, and although it was a small class size, he really took the time to care about how much his students are learning from this course. That speaks a lot about this man's character. He is a knowledgeable individual, a hard marker, but you will be forced to contort your mind into many useful ways with this course and this professor. He beckons you to think creatively and to do tasks with efficiency and purpose. Perhaps the best professor I have had the privilege to learn from. I wish there were more professors like this gentleman.



Fig. 1: Why, thank you. Thank you very much.

Good course, but working hard for the assignments and the Urban cycle wasn't paying off. Group got demoralized since hard, creative and thoughtful work was being given crap grades. I guess its cuz the course is design oriented and its easy for the TA to pick on irrelevant faults and interpret the contents erroneously as desired and given penalties as desired no matter how well you explain your work. This causes us to loose [sic] motivation, dedication and enthusiasm for a course that is supposed to be our pre-capstone course. Other than that, I do like how the course teaches us step-by-step methods to address design problems. Better evaluation of the assignments would greatly help. I would rate this course 7 or 7.5 out of 10.

Let's be clear, the TA follows my lead. Sometimes mistakes happen, and they get corrected eventually; but the idea that the TA is grading things differently than the instructor would have is wrong. Nuance and interpretation are often the aspects that make or break a design. No one else tries to explain the importance of nuance and interpretation of language in engineering, but that doesn't mean it can be ignored. By going after such features of student work, we're making you aware of how the real world will treat your work. We haven't the time to address all of these shortcomings in your education, but I'll be damned if I don't at least show students the kinds of problem that can arise.

Better class scheduling times if possible.

Scheduling in this course is always a problem. Every year, the calendar changes, and the timetable changes. This means that every year, there's some new problem that screws something up. We usually do not get our timetables till late August, so we have almost no time to adjust the course to account for those timetabling "oddities." And it's different every year. We are trying to find a more

permanent solution, but we just haven't been able to come up with anything that reliably works every year, no matter what timetabling does.

Overall a great experience so far. Couple things could be done differently. The simultaneous urban cycle and main design project splits students focus and I feel is detrimental to them both. The urban cycle is completed in mec325 so it seems unnecessary to redo it. I think it would be more conducive to do small case studies and put an even larger emphasis on the main project removing the urban cycle. As it stands now, many students will delay working on the main project to complete urban cycle milestones. It is not that work is overwhelming, it is more that the split focus denies either project the students full attention.

Excellent point. MEC723 and MEC325 are rather tightly coupled. The introduction of the urban cycle in MEC325 is relatively new. The key from my point of view is to be confident that as MEC325 changes, MEC723 doesn't suffer - and vice versa. Conservatively, it makes sense to keep the urban cycle in both courses till a really good alternative is developed. Every year, both courses get tweaked. I hope that within a couple of years, we'll be in a position to do some major adjustments to both courses. Getting rid of the urban cycle from either MEC325 or MEC723 is a priority, but there's other issues to be dealt with too. Rest assured, however, that we know about this problem and are actively pursuing alternatives.

Getting comments like this is very useful, because input from students is a great way to increase pressure on the administration to let us change the course content significantly.

Should definately by a year long course. Perhaps "field trips" would help engage students deeply. The size of the class, 15 students, is ideal for a design class.

I wish I could make MEC723 a year long course, but that would effectively add a course to the curriculum, and that is, as things stand today, an administrative "no-no."

Field trips are possible, but they're a royal pain to arrange - I would have to do all the legwork myself because there's no infrastructure to assist me on these kinds of things. I will certainly take this under advisement and see what can be done in future years.

From:

<https://deseng.ryerson.ca/dokuwiki/> - **DesignWIKI**

Permanent link:

<https://deseng.ryerson.ca/dokuwiki/mec723:start>



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