



Course Syllabus

CE595 - Blast Engineering

Department of Civil Engineering

Royal Military College of Canada

Winter 2021

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1 - COURSE DESCRIPTION

The aim of this course is to introduce blast-related topics and guide students through an individualized directed study to better understand specific concepts related to force-protection design of structures, with specific focus on blast loading.

2 - COURSE TEXTBOOKS AND REFERENCES

Cormie, D., Mays, G.C., and Smith, P.D., *Blast effects on Buildings 2nd Ed*, Thomas Telford Publications, London, UK., 2009, ISBN: 0-7277-2030-9

Dusenberry, D.O., *Handbook for Blast Resistant Design of Buildings*, John Wiley & Sons Inc., USA, 2010

Biggs, J.M., *Introduction to Structural Dynamics*, McGraw-Hill Book Co., USA, 1964

Canadian Standards Association, *CSA S850-12 Design and assessment of buildings subjected to blast loads*, Toronto, 2012.

3 - COURSE SCHEDULE

Individualized Meetings	Slot 1 - Tuesday, 10h00 to 11h00 (via Zoom) Slot 2 - Thursday, 10h00 to 11h00 (via Zoom)
Lectures	TBA

4 - LECTURES

Lectures will be given every other week (or so) on topics related to blast engineering. These will be given in both synchronous and asynchronous formats. An announcement will be made on Moodle ahead of time to announce the dates of the lectures to the class.

5 - ASSIGNMENTS

While this is a directed study-based course, several assignments will be given throughout the course to facilitate the comprehension of the topics covered during the lectures.

Assignments will consist of blast engineering design/analysis problems, as well as conducting reviews of research papers and official documents.

6 - COURSE PROJECT

Each student will be asked to select a subject related to blast engineering to study and develop in detail. The project can be:

- A novel research study by you (e.g., something related to your thesis!);
- A hypothetical design and analysis scenario;
- An important case study and its impact on the field of blast engineering, or;
- A compilation of studies aiming to understand a specific aspect of a specific theme of blast engineering.

The course project deliverables will consist of written reports, to be handed throughout the term, as well as an oral presentation to be given to the class at the end of the term. Each project has to teach the class something novel; whether it's a new discovery, it needs to demonstrate significant insight and understanding of the subject. As this is a blast engineering course, the project will require some considerations for design and analysis. Specific requirements and due dates will be communicated to the class following the start of the course.

NOTE: In a *directed study*, the professor is available to guide you as you progress with your project, and can make recommendations/comments as you both progress through the class. Particularly useful if you are having issues with a specific topic, cannot find literature, etc.

7 - GRADING SCHEME

Assignments	30 %
Course Project	70 %

8 - RELEVANT COMPUTER SOFTWARE*

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|----------------|----------------------------------|
| - LS-DYNA | - CONWEP |
| - AUTODYN | - OpenFOAM/blastFOAM |
| - RCblast | - SBEDS |
| - BlasTDOF | - Overpressure |
| - Overpressure | - Unpublished Excel Spreadsheets |

* non-exhaustive list