EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering
LE / ESSE 4370 3.0 SECTION M
FINITE ELEMENT METHODS
FALL 2019 / WINTER 2020

Last Modified Date: 08/12/2019

COURSE CALENDAR DESCRIPTION

Basic principles of finite element method, variational and weighed residual principle procedures in discretizing and building up governing equations of physical models. Use of industrial FEM codes to understand model response to external effects such as stress, heat, vibration, and fluids. Prerequisites: SC/MATH 2271 3.00; LE/ESSE 2470 3.00.

INSTRUCTOR(S)

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<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tbody>
<tr>
<td>Orszulik, Ryan</td>
<td>Sec. M / LECT / W</td>
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ADDITIONAL INFORMATION

Topics Covered
Chapter 1 – Introduction to the Finite Element Method
Chapter 2 – Fundamental Concept of the Finite Element Method
Chapter 3 – Finite Element Formulation of Beam Bending Elements
Chapter 4 – Finite Element Method for 2D Elasticity
Chapter 5 – 3D Solid Elements

Recommended but not mandatory textbooks

Grading
Assignments (3 @ 10%): 30%
Midterm: 25%
Final Examination: 45%

Course Learning Outcomes
1. Understand the role of boundary value problems in engineering and how to set them up.
2. Do meshing, element level calculations, assembly, incorporation of boundary conditions and post processing of 1-d problems.
3. Solve BVPs on paper, by writing code, by using s/w packages.
4. Understand how to use the FEM in design.
Assignment Submission
Proper academic performance depends on students doing their work not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignment. Assignments may be hand written, however all those that are intelligible/messy may be at the professor’s or Teaching Assistant’s discretion be given a score of zero. Assignments are to be handed in, in person, before the start of the lecture on the day of which it is due. Email submissions will not be considered.

Lateness Penalty
All students are expected to complete their coursework (assignments etc) in a timely fashion. All late assignments reports should be given to the instructor. An assignment will be considered late if it is handed in after the start of the lecture. Late assignments etc. will be subject to a reduced grade of 10% of the maximum grade per day late (where weekends will also count as two days). A mark of zero will be applied if the assignment is submitted after the solutions have been posted.

Missed Tests
Students who miss the mid-term examination (or leave the examination), due to documented illness, or miss the mid-term examination due to prior arrangement as documented with approval as legitimate from the Course Instructor, the weight will be added to their final exam. Otherwise, the mark will be zero. There will be no alternative dates scheduled to make up the midterm. Absence to midterm(s) must be accompanied by a formal and valid explanation within 24 hours of said absence. In addition to university policies on granting a deferred final exam, the granting of a deferred final exam also requires that the student has performed satisfactorily in the course according to the evaluation scheme established in this Course outline, excluding the final examination for which deferral privileges are requested.

ACADEMIC INTEGRITY LINKS
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Student Accessibility Services (SAS) - https://accessibility.students.yorku.ca/
- York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT
- We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Métis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
- The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
- Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements
Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.

Moodle @ York University