EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering
LE / ESSE 3040 3.0 SECTION A
ATMOSPHERIC DYNAMICS I
FALL 2019 / WINTER 2020

Last Modified Date: 09/03/2019

COURSE CALENDAR DESCRIPTION

Dynamics of large-scale weather systems. Development of the equations of motion, geostrophy, thermal wind, vorticity and divergence, Ekman layers and the quasi-geostrophic theory. Prerequisites: LE/ESSE 2010 3.00; LE/ESSE 2470 3.00 or SC/PHYS 2010 3.00; SC/MATH 2015 3.00; SC/MATH 2271 3.00. PRIOR TO FALL 2014: Prerequisites: LE/EATS 2010 3.00; LE/EATS 2470 3.00 or SC/PHYS 2010 3.00; SC/MATH 2015 3.00; SC/MATH 2271 3.00. PRIOR TO SUMMER 2013: Prerequisites: SC/EATS 2010 3.00; SC/EATS 2470 3.00 or SC/PHYS 2010 3.00; SC/MATH 2015 3.00; SC/MATH 2271 3.00.

INSTRUCTOR(S)

<table>
<thead>
<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
<th>Contact Phone</th>
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</thead>
<tbody>
<tr>
<td>Klaassen, Gary P</td>
<td>Sec. A / LECT / F</td>
<td><a href="mailto:gklaass@yorku.ca">gklaass@yorku.ca</a></td>
<td>York Ext. 77727</td>
</tr>
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ADDITIONAL INFORMATION

TOPICS AND CONCEPTS

Atmospheric Dynamics is not an easy subject, and the difficulty ramps up throughout the term. Students are expected to supplement the lectures by reading/working through the textbook and attempting to solve problems themselves.

6 Tutorials will be held in conjunction with assignments (TBA), and will include review problems, supplementary material (e.g. films) computer exercises. Attendance strongly recommended.

COURSE CONTENT

(Holton Ed4: Ch. 1-6, HH ed5 Ch.1-4,6,8)
6. The planetary boundary layer. Turbulence. The Ekman layer.

REFERENCES

1. An Introduction to Dynamic Meteorology. 5th Edn. 2013 J.R. Holton and G.J. Hakim [Recommended text. 4th Edition 2004 is also acceptable, but note some chapters are rearranged]]
5. Atmosphere-Ocean Dynamics. A.E. Gill 1982 (geophysical fluid dynamics)

**GRADED ASSESSMENT**

Term work (Assignments: 4 or 5): 30%
Midterm Exam (1 hour): 20%
Final Exam (3 hours): 50%

If the midterm is missed for a valid documented reason, the final exam will count for 70% of the mark. The penalty for late work is 10% per day.

**ADDITIONAL INFORMATION**

National Committee for Fluid Mechanics Films:
- edu/hml/ncfmf.html,
- Vorticity I+II, many others

**ALTERNATE LINKS**

- Vorticity Part 1: http://www.youtube.com/watch?v=loCLkcYEWD4
- Vorticity Part 2: http://www.youtube.com/watch?v=h6bmrRFYFbc

**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/

Many courses utilize Moodle, York University’s course website system. If your course is using Moodle, click here to access it.

Moodle @ York University