EXPANDED COURSE DESCRIPTION
EARTH, SPACE SCIENCE AND ENGINEERING
Lassonde School of Engineering
Earth and Space Science and Engineering
LE / ESSE 4050 3.0 SECTION A
SYNOPTIC METEOROLOGY I
FALL 2017 / WINTER 2018

Last Modified Date: 08/23/2017

COURSE CALENDAR DESCRIPTION

Analysis of mid-latitude synoptic scale weather systems: an introduction to storm tracks, fronts and air masses, and diagnostic methods. Analysis and interpretation of surface weather maps and upper-air charts. Two lecture hours, three laboratory hours. Fall term. Three credits. Prerequisite or corequisite: LE/ESSE 3040 3.00. Prior to Fall 2014: Prerequisite or corequisite: LE/EATS 3040 3.00. Prior to Summer 2013: Prerequisite or corequisite: SC/EATS 3040 3.00.

INSTRUCTOR(S)

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<th>Name</th>
<th>Section / Format / Term</th>
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<td>Prout, Melville</td>
<td>Sec. A / LECT / F</td>
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ADDITIONAL INFORMATION

Format: Two lecture hours. Three laboratory hours. One term. Three credits.

Text: Notes and labs will be supplied in class.

References: An Introduction to Dynamic Meteorology (3rd Edition), James R. Holton (Academic Press, 1992); Synoptic-Dynamic Meteorology in Midlatitudes (Volume 1), H.B. Bluestein (Oxford University Press); MANOBS, METAR Codes

Lecture Content:
- Analysis of 3D structure of meteorological fields, including pressure, pressure tendencies, temperature, moisture and wind.
- Operational instrumentation (including satellites and radar) for measuring primary fields.
- Atmospheric scales of motion, general circulation.
- The practical use of tephigrams and hodographs including stability profiles.
- QG equations of motion, continuity, thermodynamics and vorticity/divergence in the context of analysis and prediction.
- Practical application of kinematics for temperature and vorticity
- Air masses and fronts: air mass characteristics and development, frontal models and frontogenesis, associated clouds and weather, storm tracks.
- Introduction to the Energetics approach to development of synoptic scale systems.

Laboratory Content:
- METAR codes, PIREPS, surface and upper air plots.
- Analysis and interpretation of various surface and upper air isopleths.
- Practical use of tephigrams and hodographs: stability, temperature, potential temperature, moisture, cloud types and vertical extent, inversions, frontal motion.
- Analysis of surface and upper-air charts: vorticity and thermal advections, divergence/convergence and associated vertical motion.
Application of energetics to synoptic scale development.

Note: Access to a computer and some knowledge of the Internet, while not absolutely necessary would be beneficial.

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
- Counselling and Disability Services - http://cds.info.yorku.ca/

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