NATS 1780 A 6.0 Y (Summer 2014): Weather and Climate

"Weather and Climate" is a course designed to fulfill the General Education requirement of students in the Faculty of Liberal Arts and Professional Studies as well as the Faculty of Fine Arts. As such, this course aims to acquaint students not intending to be professionally involved in science, with some of the concepts, methods and achievements of science. It is designed specifically to allow students who have little science or mathematical background to learn about the science behind weather and climate as well as to frame associated issues in appropriate contexts.

Course Director:
Ian Lumb (Bethune 217) ext: 33601 ianlumb@yorku.ca

- Office hours (Online, by appointment)

Course Format:

- 6-10 hours online (approximately) per week via Moodle
    - In the SU14 Term, this is a ***double-speed course*** - in other words, one week in the SU14 Term is equivalent to two weeks in the FW14 Term.
- Final Examination
    - In person at York's Keele Campus or via Distance Education
    - Schedule TBD by Registrar's Office

Grading:

3 assignments (5% each)	15%
1 course journal (5%)	5%
4 quizzes (7.5% each, best 4 of 5)	30%
8 tutorials (1% each + 2% forum part'n)	10%
Participation (via Moodle forums)	5%
Final exam	35%

Text:

Meteorology Today: An Introduction to Weather, Climate, and The Environment, First Canadian Edition, Ahrens, Jackson & Jackson, 2011 (REQUIRED)

Degree Credit Exclusions: SC/NATS 1750 6.00, SC/EATS 1011 3.00. Not open to any student enrolled in the Earth & Space Science & Engineering program.

Detailed Course Outline

Note: Not necessarily covered in the order presented.

A. Properties Of The Earth's Atmosphere

A1. *Overview*

A2. *Atmospheric Temperature*
- Measurement and scales
- Variation with altitude and location

A3. *Atmospheric Pressure*
- Measurement: barometer
- Atmospheric pressure
- Mass of the atmosphere
- Variation of pressure with height

A4. *Atmospheric Density*
- Density and buoyancy

A5. *Atmospheric Composition*
- Fixed and variable constituents
- Variation of atmospheric composition with height

B. Radiation, the Sun and Interactions with the Atmosphere

B1. *Nature of Radiation: Properties of Light*
- Electromagnetic radiation
- EMR as waves, speed, wavelength and frequency

B2. *The Solar Spectrum*
- Properties of the Sun
- Properties of black bodies, Planck's Law, Stefan-Boltzmann Law, Wien's Law
- Absorption and emission of radiation in the atmosphere

C. Origin and Evolution of the Atmosphere

C1. *Origin of the Earth's Atmosphere*
- Origin of the Earth and its original atmosphere
- Loss of the original atmosphere

C2. *Evolution of the Earth's Atmosphere*
- Production of the atmospheres of early Earth, Mars and Venus
- Impact of life on the Earth's Atmosphere

D. Climate and Climate Change

D1. *Climate vs Weather*
- What's the difference?
- Climatic zones

D2. *"Recent" History of Earth's Climate*
- Evidence for a variable climate
- Reasons for climate changes

D3. *The Future of Earth's Climate*

E. Meteorology

E1 *Condensation and Clouds*
- Phase relations for water
- Humidity and stability
- Condensation, clouds and fogs
- Precipitation

E2. *Air in Motion*
- Winds and their causes
- Thermal circulation
- Forces modifying winds
- Balanced winds
- Observing the wind

E3. *Wind Systems of the Earth*
- Local winds
- General circulation models

E4 *Air Masses and Fronts*
- Air masses
- Air mass characteristics
- Air mass modification
- Fronts and cyclogenesis

E5. *Atmospheric Storms*
- Thunderstorms
- Tornadoes
- Hurricanes

Accommodations
Students who feel that there are circumstances that may interfere with the successful completion of their exams or other course requirements are encouraged to discuss their concerns with the Course Director as soon as possible.

Differently abled students who require reasonable accommodations in teaching style or evaluation methods should discuss the matter with the Course Director early in May 2014 so that appropriate arrangements can be made.

Academic Integrity
From the Academic Integrity Web Site:

> "York University is proud of the high quality programs it provides for our students. Our faculty and staff work hard to encourage high academic achievement by students. ***The University takes academic integrity very seriously.***"

Students are encouraged to familiarize themselves with academic integrity by reviewing the content available online at http://www.yorku.ca/academicintegrity/.

Quizzes and Exams
Attendance for the final exam is mandatory. An exam missed as a consequence of medical circumstances must be supported by an **Attending Physician's Statement**, which can be downloaded from: http://www.registrar.yorku.ca/pdf/petition_package.pdf, or a statement by a psychologist or counselor. **Students are NOT expected to disclose the nature of the illness.** The document must specify:
1) Date of consultation.
2) Contact information (e.g. phone number of the hospital; legible name of the health provider) that would allow verification of the document.
3) A statement that the student would not have been able to attend class (or carry out activities) during the relevant period of time.
4) The document must be signed by the attending physician.

The documentation must be dated on the same day as the exam or earlier, or it will not be accepted. **The Course Director must be notified by email within 24 hours in the case of a missed test or exam.** Appropriate documentation must be submitted to the Course Director within one week after the test or exam. No opportunities to make up missed quizzes will be offered. However, after acceptable justification for a missed quiz has been received, the percentage value of the missed quiz will be added to the final exam.

Instructional Media

This is an online course that makes use of Moodle (https://moodle.yorku.ca). Please ensure you have access to the course's Moodle site about one week prior to the course start date (**May 5, 2014**). Because this course runs at double speed, keeping pace with Moodle is critical to ensuring student success.

In addition to Moodle, you can optionally follow the instructor via http://twitter.com/nats1780.

Sending Email to the Course Director

Moodle is the primary instructional platform for the course. The instructor attempts to ensure that the information provided via Moodle is comprehensive and current. Therefore, prior to sending email to the instructor, please ensure you have already attempted to make use of Moodle to acquire the information you seek. If you have a question that is *not* of a private nature (e.g., regarding grades, absence), please make use of the Moodle forums, as one of your classmates or TAs may be able to provide you with an answer before the instructor can.

If you feel that email to the instructor is actually required, please:

- **Send from your yorku.ca email** account (not from hotmail, gmail, etc.) – emails from non-yorku.ca accounts may languish in a spam folder that is checked only intermittently (if at all).
- Include your full name and student number in your email.
- Include "NATS 1780 A SU 2014" in the subject line at the bare minimum.

With almost 200 students in the course, your attention to this process is greatly appreciate - and benefits all students in the course.

Important Dates:

- The course start date is **May 5, 2014.**
- The last date students can enroll in this course without the permission of the instructor is **May 16, 2014.**
- The last date students can enroll in this course with the permission of the instructor is **May 30, 2014.**
- The last date students can drop the course without receiving a grade is **July 4, 2014.**
- The course end date is **July 29, 2014.**
- The exam period will be from Wednesday, **August 6, 2014** to Monday, **August 18, 2014** (no week-ends).

Please consult UNDERGRADUATE SUMMER 2014 SESSIONAL DATES as the definitive source of information regarding important dates.

Please consult http://goo.gl/YZVsK for a calendar specific to NATS 1780 A.

***** THE END *****