# Course Outline Form: Fall 2015

## General Information

**Course Title:** Meteorology and Climatology ENVS\*2030

**Course Description:** This course examines solar and terrestrial radiation; pressure systems and winds; atmospheric stability and vertical motions; air masses and fronts; clouds and precipitation; tropical weather systems: air pollution and climate change.

**Credit Weight:** 0.50

**Academic Department (or campus):** School of Environmental Sciences

**Campus:** Guelph

**Semester Offering:** Fall 2015

**Class Schedule and Location:** Lectures MCKN227 MWF 14:30—15:20

Lab 1: Th 15:30—17:20 GRHM2310

Lab 2: W 15:30—17:20 ALEX218

## Instructor Information

**Instructor Name:** Claudia Wagner-Riddle

**Instructor Email:** cwagnerr@uoguelph.ca

**Office location and office hours:** Alexander 110, MWF 13:30—14:20

**Instructor Name:** Jon Warland

**Instructor Email:** jwarland@uoguelph.ca

**Office location and office hours:** Alexander 270, MWF 13:30—14:20

## GTA Information

**GTA Name:**

**GTA Email:**

**GTA office location and office hours:**

## Course Content

### Specific Learning Outcomes:

At the end of this course, students will be able to…

1. Identify weather instruments and state how they are placed in a weather station;
2. Use laws of radiation to explain radiation transfer in the environment and solve problems related to radiation budgets;
3. Apply the energy budget concept to explain the Earth's climate at the surface and human thermal comfort;
4. Describe, use and convert measures that quantify atmospheric water vapour;
5. Predict the formation of clouds and rain using atmospheric sounding data and a skew-T diagram;
6. Describe the Bergeron process for formation of precipitation using the concept of vapour pressure over water and ice;
7. Predict wind speed and direction from isobars and isoheights using a force-body diagram;
8. Access public data on weather and climate, including historical records, current and forecast conditions;
9. Interpret surface and upper air weather maps, including all basic symbols, and use this to state current weather conditions at any point;
10. Use the Norwegian cyclone model and the concepts of air masses and fronts to produce a short-range forecast from a map of current conditions;
11. Use the Hadley cell model, trade winds and the ITCZ to explain precipitation patterns in the tropics;
12. Apply simple models to predict the dispersion of air pollutants;
13. Explain uncertainties in climate change predictions using the concepts of positive and negative feedback in the climate system.

**Approximate Schedule of Lectures and Labs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Week of | Lecture Topics | Lab Topics | Instructor | Evaluations |
| Sep 11 | Introduction | No lab | CWR |  |
| Sep 14 | Radiation | No lab | CWR |  |
| Sep 21 | Radiation | Radiation | CWR | Lab exercise |
| Sep 28 | Water in the Atmosphere | No lab | CWR |  |
| Oct 5 | Stability and Clouds | Climate and Comfort | JW (lect); CWR (lab) | Lab exercise |
| Oct 12 | Precipitation Processes | No lab | JW | Mid-term 1 |
| Oct 19 | Atmospheric Motions | Stability | JW | Lab exercise |
| Oct 26 | Atmospheric Motions | No lab | JW |  |
| Nov 2 | Air Masses and Fronts | Wind and Maps | JW | Lab exercise |
| Nov 9 | Air Masses and Fronts | No Lab | JW | Mid-term 2 |
| Nov 16 | Tropical Weather Systems | Fronts and Forecasting | JW (lab);  CWR (lect) | Lab exercise |
| Nov 23 | Air Quality | Air Quality (Thurs. class) | CWR |  |
| Nov 30 | Climate Change | Air Quality (Wed. class) | CWR | Lab exercise |

### Labs:

Lab assignments will be posted on CourseLink. Please bring a copy with you to each lab.

### Course Assignments and Tests:

Your performance in the course will be evaluated through two Mid-term Exams, Lab Exercises and the Final Exam. The Mid-Term Exams will have an in-class part (worth 15% of the total mark) and a take-home part (to be completed individually, worth 5%).

|  |  |  |  |
| --- | --- | --- | --- |
| Assignment/Exam | Value | Due Date | Learning Outcomes |
| Lab Exercise on Radiation | 4%\* | Sep 25 | 1, 2 |
| Lab Exercise on Human Comfort | 4%\* | Oct 9 | 2, 3, 4 |
| Lab Exercise on Stability | 4%\* | Oct 23 | 4, 5, 6 |
| Lab Exercise on Wind and Maps | 4%\* | Nov 6 | 7, 9 |
| Lab Exercise on Fronts and Forecasting | 4%\* | Nov 20 | 8, 9, 10 |
| Lab Exercise on Air Pollution | 4%\* | Dec 4 | 12 |
| Mid-Term Exam 1 | 20% | Oct 16 (in-class part, 15%)  Oct 19 (take-home part, 5%) | 1, 2, 3, 4 |
| Mid-Term Exam 2 | 20% | Nov 13 (in-class part, 15%)  Nov 16 (take-home part, 5%) | 5, 6, 7 ,9 |
| Final Exam (scheduled by Registrar) | 40% | Dec 7 (7:00 pm-9:00 pm) | All |

\*the lowest lab mark will be dropped (i.e. only 5 out of 6 labs will be considered in the final mark)

**Final examination date and time:** Dec 7, 2015, 19:00—21:00

**Final exam weighting:** 40%

## Course Resources

### Recommended Texts:

***Meteorology Today: An Introduction to Weather, Climate, and the Environment*** by C. Donald Ahrens, Peter L. Jackson, and Chris Jackson, 1st Canadian edition, published by Nelson (ISBN-10: 0-17-650039-1, ISBN-13: 978-0-17-650039-9). One copy of the textbook is on 2-hour reserve in the Library. Supplementary notes, including Review Questions and Practice Problems, will be provided on Courselink.

## Course Policies

### Grading Policies:

No late submissions will be accepted without medical or compassionate justification, documentation may be requested.

### Course Policy on Group Work:

The take-home portion of the Mid-Term Exam must be completed individually. Discussion on lab exercises is encouraged but the work submitted should be your own.

### Course Policy regarding use of electronic devices and recording of lectures:

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the written permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## University Policies

### Academic Consideration:

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml).

### Academic Misconduct:

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring.

University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection. Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Detailed information regarding the Academic Misconduct policy is available in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml).

### Accessibility:

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Student Accessibility Services (SAS), formerly Centre for Students with Disabilities (CSD), as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email sas@uoguelph.ca or visit the [Student Accessibility Services website (http://www.uoguelph.ca/csd/)](http://www.uoguelph.ca/csd/).

### Course Evaluation Information:

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](https://courseeval.uoguelph.ca/) **for more information.**

### Drop period:

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III (Schedule of Dates) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/).

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII (Undergraduate Degree Regulations and Procedures) of the Undergraduate Calendar](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/).