# http://www.ric.edu/webcommunications/images/SealWithText_Small_Black.pngUNDERGRADUATE CURRICULUM COMMITTEE (UCC)PROPOSAL FORM

## Cover page roll over blue text to see further important [instructions](#instructions): please read.

**N.B. DO NOT USE HIGHLIGHT, JUST DELETE THE WORDS THAT DO NOT APPLY TO YOUR PROPOSAL**

**ALL numbers in section (A) need to be completed, including the impact ones.**

|  |  |  |
| --- | --- | --- |
| A.1. [Course or program](#Proposal) | **PSCI 214 Introduction to Meteorology** |  |
| [Replacing](#Ifapplicable)  |  |  |
| A.2. [Proposal type](#type) | **Course: revision**  |  |
| A.3. [Originator](#Originator) | **Peter S. Meyer** | [Home department](#home_dept) | **Physical Sciences** |
| A.4. [Rationale](#Rationale) | **This course will provide a scientific foundation for understanding weather and climate. It will address topics such as weather forecasting and climate change that are of interest and concern to a large population of students. This course will serve as a new Advanced Quantitative and Scientific Reasoning course for the General Education Program. The revised course will have a new workshop component that will allow students to collect meteorological data from a number of different weather stations, to analyze and interpret their data in groups, and to present their findings in class.** |
| A.5. [Date submitted](#date_submitted) | **4/17/17** | A.6. [Semester effective](#Semester_effective) | **Fall, 2017** |
| A.7. [Resource impact](#Resource) | *[Faculty PT & FT](#faculty" \o "Need to hire new full-time or part-time faculty? This is where you indicate if this proposal will be affecting FLH in your department/program.)*:  | **Minimal impact on Faculty load with 1 section per year** |
|  | [*Library*:](#library) | **No new resources are necessary** |
|  | [*Technology*](#technology) | **No new resources are necessary** |
|  | [*Facilities*](#facilities): | **No new resources are necessary** |
| A.8. [Program impact](#prog_impact) | **None** |
| A.9. [Student impact](#student_impact) | **New AQSR option that is of broad interest and impact.** |
| A.10. The following screen tips are for information on what to do about catalog copy until the new CMS is in place; check the “Forms and Information” page for updates. [Catalog page.](#catalog)  [Where are the catalog pages](#catalog)? [Several related proposals](#catalog)? Do **not** list catalog pages here. **All** catalog copy for a proposal must be contained within a **single** file; put page breaks between sections. Make sure affected program totals are correct if adding/deleting course credits. |

B. [NEW OR REVISED COURSES](#delete_if) **DELETE THE WORDS THAT DO NOT APPLY TO YOUR PROPOSAL within specific categories, but do not delete any of the categories. DO NOT use highlight. Delete this whole page if this proposal does not include a new or revised course.**

|  | Old ([for revisions only](#Revisions)) | New |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  | **PSCI 214** | **PSCI 214** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title)  | **Introduction to Meteorology** | **Introduction to Meteorology** |
| B.4. [Course description](#description)  | The structure of the atmosphere and the processes relevant to the study of weather are considered. Emphasis is on the physical laws that govern atmospheric phenomena. Lecture. | Students will focus on the structure, composition, and phenomena of the atmosphere. Students examine local and global scale weather patterns, and century to millennial scale climate change. |
| B.5. [Prerequisite(s)](#prereqs) | **None** | **Completion of any mathematics or natural science general education distribution.** |
| B.6. [Offered](#Offered) | **Spring |Annually** | **Fall |Annually** |
| B.7. [Contact hours](#contacthours)  | **3** | **4** |
| B.8. [Credit hours](#credits) | **3** | **4** |
| B.9. [Justify differences if any](#differences) | The extra hour of class time will be used for in-class activities. |
| B.10. [Grading system](#grading)  | **Letter grade**  | **Letter grade**  |
| B.11. [Instructional methods](#instr_methods) | **| Lecture**  | **|Lecture |Small group | In-Class Activities** |
| B.12.[Categories](#required) | **Free elective**  | **|Free elective** |
| B.13. Is this an Honors course? | **NO** | **NO** |
| B.14. [General Education](#ge)N.B. Connections must include at least 50% Standard Classroom instruction. | **YES |****category: SM in Old Gen. Ed. program** | **YES |****category: Advanced Quantitative and Scientific Reasoning**  |
| B.15. [How will student performance be evaluated?](#performance) | **Class participation | Exams |Quizzes |** | **Class Participation | Exams |Papers |** **In-Class Activities |Quizzes |** |
| B.16. [Redundancy statement](#competing) | **NA** | **NA** |
| B. 17. Other changes, if any |  |

| B.18**.** [**Course learning outcomes**](#outcomes) | [**Standard(s)**](#standards) | [**How will they be measured**](#measured)**?** |
| --- | --- | --- |
| 1. Students understand the elements of weather and develop skills to measure temperature, pressure, humidity, wind speed, wind direction, and precipitation. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 2. Students understand the composition and structure of the atmosphere, construct plots of meteorological data, and identify layers in the atmosphere. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 3. Students understand the atmospheric greenhouse effect and its significance to life on Earth. | Gen. Ed. Outcomes 2, 10, 11 | See B.15 |
| 4. Students understand the role of heat and pressure in controlling the dynamics of the atmosphere. They calculate horizontal and vertical pressure and temperature gradients. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 5. Students can read weather maps and construct them using data from weather stations in the U.S. Students make forecasts based on the analysis of weather maps. | Gen. Ed. Outcomes 2, 10, 11 | See B.15 |
| 6. Students understand seasonal variations in mean monthly temperatures at different locations on Earth. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 7. Students can identify climate zones based on weather data and detect shifting zones from historical data. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 8. Students can describe climate change in different parts of the country using historical data from weather stations. | Gen. Ed. Outcomes 10, 11 | See B.15 |
| 9. Students understand natural and anthropogenic causes of climate change. They develop hypotheses to support or refute their opinion on human-induced climate change. | Gen. Ed. Outcome 2 | See B.15 |

| B.19. [**Topical outline**](#outline) |
| --- |
| 1. Weather and Climate
	1. Elements of Weather
2. Earth’s Atmosphere
	1. Composition of the Atmosphere Today
	2. Early History of the Atmosphere
	3. Vertical Structure of the Atmosphere (Temperature, Pressure, Density, Composition)
3. Energy, Temperature, and Heat
	1. Temperature Scales
	2. Specific Heat
	3. Latent Heat
	4. Heat Transfer (Conduction, Convection, Radiation)
	5. The Atmospheric Greenhouse Effect
4. Seasonal and Daily Temperature Variations
	1. Temperature Measurements and Scales
	2. Earth-Sun Geometry
	3. Seasons in the Northern and Southern Hemispheres
	4. Determination of Daily and Monthly Mean Temperatures
	5. Temperature Variations in Inland, Coastal, and Mountainous Regions
5. Atmospheric Humidity
	1. Evaporation, Condensation, and Saturation
	2. Specific Humidity, Mixing Ratio, and Relative Humidity
	3. Measuring Humidity, Computing Relative Humidity and Dew Point
	4. Formation of Dew, Radiation Fog, Advection Fog, Evaporation Fog, and Upslope Fog
	5. Types of Clouds
6. Atmospheric Stability
	1. Determining Stability
	2. Environmental and Adiabatic Lapse Rates
	3. Stability and Cloud Development
	4. Causes of Instability
	5. Inversions
7. Precipitation
	1. Formation and Evolution of Cloud Droplets
	2. Types of Precipitation and Atmospheric Conditions
8. Air Pressure and Winds
	1. Daily Pressure Variations
	2. Pressure Measurements
	3. Station Pressure and Surface Pressure
	4. Surface and Upper Level Charts (Constant Pressure and Constant Height Charts)
	5. Pressure Gradient Force
	6. Coriolis Force
	7. Air flow around High and Low Pressure
9. Small-Scale and Local Wind Systems
	1. Sea and Land Breezes
	2. Katabatic, Chinook, and Santa Ana Winds
	3. Tornadoes
	4. Determining Wind Direction and Speed
10. Global Wind Systems
	1. General Circulation of the Atmosphere
	2. Prevailing Surface Winds, Pressure, and Precipitation
	3. Jet Streams
	4. El Nino and the Southern Oscillation
11. Air Masses and Fronts
	1. Source Regions and Air Masses of North America
	2. Cold Fronts, Warm Fronts, Occluded Fronts, Stationary Fronts
12. Mid-Latitude Cyclones
	1. Formation and Cyclogenesis
	2. Vertical Structure of Deep Dynamic Lows
	3. Upper-Level Waves, Convergence, and Divergence
	4. The Role of the Jet Stream
13. Weather Maps and Weather Forecasting
	1. Map Symbols, Station Model, Isotherms, Isobars
	2. Weather Forecasting Tools and Methods
	3. Types of Forecasts
14. Hurricanes
	1. Anatomy of a Hurricane
	2. Stages in the Formation and Dissipation of Hurricanes
	3. Hurricane Tracking
	4. Notable Hurricanes
15. Climate Change
	1. Prehistoric Climate Change
	2. Recent Climate Change
	3. Natural Causes of Climate Change
	4. Anthropogenic Causes of Climate Change
	5. Impact of Climate Change
	6. Projections
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## D. Signatures

##### D.1. Approvals

* Changes that affect General Education in any way MUST be approved by ALL Deans and COGE Chair.
* Changes that directly impact more than one department/program MUST have the signatures of all relevant department chairs, program directors, and relevant dean (e.g. when creating/revising a program using courses from other departments/programs). Check UCC manual 4.2 for further guidelines on whether the signatures need to be approval or acknowledgement.
* Proposals that do not have appropriate approval signatures will not be considered.
* Type in name of person signing and their position/affiliation.
* Send electronic files of this proposal and accompanying catalog copy to curriculum@ric.edu and a printed or electronic signature copy of this form to the current Chair of UCC. Check UCC website for due dates.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Peter Meyer | Chair / Physical Sciences  |  |  |
| James Magyar | Chair / Committee on General Education |  |  |
| Earl Simson | Dean / Faculty of Arts and Sciences |  |  |
| Donald Halquist | Dean / Feinstein School of Education and Human Development |  |  |
| Jeffrey Mello | Dean / School of Management |  |  |
| Jane Williams | Dean / School of Nursing |  |  |
| Sue Pearlmutter | Dean / School of Social Work  |  |  |

##### D.2. [Acknowledgements](#acknowledge)

| Name | Position/affiliation | [Signature](#Signature_2) | Date |
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