

**Cover/Signature Page - Abbreviated Template**

Institution Submitting Request: *University of Utah*

Proposed Title: **Undergraduate Certificate in Climate Change**

Currently Approved Title: **Undergraduate Certificate in Climate Change**

School or Division or Location: *University of Utah, College of Social and Behavioral Science*

Department(s) or Area(s) Location: *Geography Department*

Recommended Classification of Instructional Programs (CIP) Code<sup>1</sup> (for new programs): [45.0799](#)  
(Geography, Other.)

Current Classification of Instructional Programs (CIP) Code (for existing programs): *00.0000*

Proposed Beginning Date (for new programs): *08/01/2013*

Institutional Board of Trustees' Approval Date: *MM/DD/YEAR*

Proposal Type (check all that apply):

R401-5			R401-6		
<i>Items submitted will be reviewed by OCHE. If there are any issues, the proposal will be returned for clarification/correction. If no issues, the proposal will be returned with a note of approval and the request will be placed on the General Consent Calendar of the next Regents' agenda.</i>			<i>Items submitted will be reviewed by OCHE. If there are any issues, the proposal will be returned for clarification/correction. If no issues, the proposal will be returned with a note of approval and the request will be placed on the General Consent Calendar of the next Regents' agenda.</i>		
Section #		Item	Section #		Item
4.1.5.2	<input type="checkbox"/>	Minor*	6.1.1	<input type="checkbox"/>	Reinstatement of Previously Suspended Program
5.1.1.1	<input type="checkbox"/>	New Emphasis on an Existing Degree*	6.1.5	<input type="checkbox"/>	Reinstatement of Previously Suspended Unit
5.1.2	X	Certificate of Proficiency Not Eligible for Financial Aid			
5.1.3	<input type="checkbox"/>	Out-of-Service Area Delivery of Programs			
5.1.4	<input type="checkbox"/>	Name Change of Existing Programs			
5.1.5	<input type="checkbox"/>	Program Transfer			
	<input type="checkbox"/>	Program Restructure			
	<input type="checkbox"/>	Program Consolidation			
5.1.6	<input type="checkbox"/>	Program Discontinuation			
	<input type="checkbox"/>	Program Suspension			
5.1.7	<input type="checkbox"/>	Administrative Unit Creation			
	<input type="checkbox"/>	Administrative Unit Transfer			
	<input type="checkbox"/>	Administrative Unit Consolidation			
5.1.8	<input type="checkbox"/>	New Center			
	<input type="checkbox"/>	New Institute			
	<input type="checkbox"/>	New Bureau			
5.1.9	<input type="checkbox"/>	Graduate Certificate			

\*Requires "Section VI: Program Curriculum" of Abbreviated Template

**Chief Academic Officer (or Designee) Signature:**

I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

\_\_\_\_\_  
Signature

Date:

Printed Name:

<sup>1</sup> CIP codes must be recommended by the submitting institution. For CIP code classifications, please see <http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55>.

**University of Utah**  
**Undergraduate Certificate in Climate Change**  
**1/13/13**

**Section I: Request**

The Geography Department at the University of Utah proposes to develop an undergraduate certificate program in Climate Change. The proposed certificate was provided to all Geography Department faculty via email early in September 2012 for review. Suggestions received were incorporated and the proposal was discussed at the September 28, 2012 faculty meeting where it was approved. The proposed certificate takes advantage of a recently developed curriculum in climate change courses in Geography along with climate change courses in other departments on campus to provide an interdisciplinary, value-added educational opportunity for students wanting to increase their expertise in climate change and their marketability for careers requiring this type of expertise.

**Section II: Need**

Human alteration of Earth's climate is an accepted scientific fact (Anderegg et al., 2010; IPCC, 2007; Oreskes, 2004). As a result of the politicization of the issue and poor communication by the scientific community, the public and private sectors have gained limited knowledge of how the climate system operates, the science of climate change research, and societal impacts of these changes. As the impacts of climate change become more severe over the coming years and decades, companies, government agencies, and non-governmental organizations will be required to adapt and respond to climate change. Scientifically-based, up-to-date knowledge is essential to formulating adaptation and response strategies. A certificate in climate change is marketable evidence of this essential knowledge.

This program will provide students with cutting edge knowledge about climate, climate change, impacts and relevance. By taking earning the certificate, the students will:

- Understand the fundamentals of climate systems.
- Understand the fundamentals and scientific background of climate change.
- Understand the science of global warming.
- Learn about mitigation and adaptation strategies for dealing with climate change.
- Learn how climate change permeates nearly every aspect of our lives.

This certificate would be valuable to a wide range of career options including but not limited to:

- land managers, governmental employees, environmental and social equity advocates, and environmental consultants;
- local, state, and federal government administrators;
- natural and geological science researchers, scientists, planners, and policy-makers; as well as individuals looking to be better global citizens by understand the science behind climate change.

The decision to develop the certificate program is based on faculty and student interest and participation in the Department of Geography's primary climate change course, Global Climate Change (GEOG 3210/5210). The class grows every semester (2012 enrollment ~75 students) and students from across campus are represented, with over 75% coming from majors outside Geography. Majors represented include Accounting, Atmospheric Science, Languages, Economics, Law, Anthropology, Geology and more. There is direct relevance of climate change to all majors and career options and having an organized curriculum and training would provide increased marketability to a wide variety of careers.

There are not many certificate programs like the one proposed here. One similar program was identified at the University of British Columbia. This program (<http://cstudies.ubc.ca/sustainability/decision-making-for-climate-change/index.html>) only consists of 4 classes. Because of this example, we propose a minimum of an 18 credit course sequence for our climate change certificate.

### Section III: Institutional Impact

The proposed certificate program would be managed in the Geography Department in the College of Social and Behavioral Science at the University of Utah. The climate coursework series has already been developed in this department and the development of a new certificate will take advantage of the existing infrastructure while providing undergraduates an opportunity to complement their degree with a “value added” component to enhance marketability. As an interdisciplinary certificate, there will be financial benefit to the Atmospheric Sciences, Environmental Science and Sustainability and Biology programs, as students who might not have taken one of their courses may now do so in pursuit of the certificate. Contact has been made with all departments and colleges who might have relevant coursework to contribute. Specifically, outside Geography contact has been made with Drs. Strong and Reichler from Atmospheric Science, Drs. Ehleringer, Bowling, Gard and Nesbitt from Biology, and Drs. Cachelin and McCool from Environmental Studies and Sustainability who have all provided suggestions for coursework. I have also solicited input from the Global Change and Sustainability Center faculty and students.

All required courses are taught at least once per year and there is a commitment from the Geography Department to continue to do so. No new faculty or staff are required, and the program would take advantage of recent faculty additions in climate change research in Geography. Core climate change courses in the Department of Geography are taught by Drs. Simon Brewer, Andrea Brunelle, Mitchell Power and Mr. Larry Coats. Because the Department of Geography has experience managing the Geographic Information Science certificate, the new administrative burden is not extensive. The Undergraduate Director will direct the certificate as part of their departmental duties. Courses proposed as electives will be vetted by the Director of the Certificate and must meet the following criteria: 1) be offered at the 3000 level or higher and 2) include at least 2 weeks of material directly related to climate change that is explicitly indicated on the syllabus.

### Section IV: Finances

No new costs are associated with the development of this certificate program. Revenue from increased student enrollments will benefit all departments involved.

### Section VI: Program Curriculum

#### All Program Courses

Category	Course Prefix & Number	Title	Credit Hours
Required	ATMOS 5400 <i>or</i> GEOG 5205	The Climate System  Regional and Global Climates	3
	GEOG 5210	Global Climate Change	3
	GEOG 5215	Climate Change and Its Impacts	3
	<b>Sub-Total</b>		<b>9</b>
	3 Elective Courses	ATMOS 3100	Atmospheric Chemistry & Air Pollution
ATMOS 3200		Mountain Weather and Climate	3
BIOL 3440/3460		Global Change Ecology/ Global Issues	3

Category	Course Prefix & Number	Title	Credit Hours	
	BIOL 5440	Urban Ecology	3	
	BIOL 5490	Ecosystem Ecology	3	
	ENVST 5365	Environmental Justice	3	
	GEOG 5275	Vegetation and Climate Change	3	
	GEOG 5460	Popular Literature on Climate Change	3	
	GEOG 5410	Paleoclimatology	3	
	GEOG 5375	Sustainable Transportation	3	
	GEOG 5270	Biogeography: Global Patterns of Life	4	
	GEOG 5090	Medical Geography	3	
		<b>Sub-Total (minimum)</b>		<b>9</b>
		<b>18-19</b>		

### New Courses to Be Added in the Next Five Years

Over the last 3 years the core courses have been developed and approved. No new needed courses are planned at this time however new electives can be added per the vetting process described above.

### Recommended Program Schedule

The core courses are offered so that the sequence can be completed in 3 semesters (fall, spring, fall sequence). Electives may be taken throughout the sequence, however we will advise that they be taken after the initial core course has been completed.

Semester 1	Course Prefix and Number	Course Title
Fall (first core course)	GEOG 5205	Regional and Global Climates
	or ATMOS 5400	The Climate System
<b>Semester 2</b>		
Spring (second core course + 1 elective)	GEOG 5210	Global Climate Change
	XXXX	Elective 1
<b>Semester 3</b>		
Fall (third core course + 2 electives)	GEOG 5215	Climate Change and Its Impacts
	XXXX	Elective 2
	XXXX	Elective 3

The certificate as designed is meant to be an attribute of an existing course of study for a student or may be earned independently after the successful completion of a bachelor's degree. It is anticipated that in the future a sufficient number of the courses would be available in an on-line format and the certificate would potentially be offered to non-matriculated students in the context of Continuing Education.

January 13, 2013

Dear Undergraduate Council;

I am writing as the director of the Environmental and Sustainability Studies Program. I strongly endorse the proposal submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. This proposal has been carefully reviewed in detail by me and other affected programs and departments. This is an excellent option for our ENVST students, and I think it will be quite popular among our students.

Sincerely,



Daniel McCool  
Professor and Director

March 4, 2013

TO: Michael Hardman  
Interim Senior Vice President for Academic Affairs

FR: Ann Darling *EB for AD*  
Chair, Undergraduate Council

RE: **New Undergraduate Certificate in Climate Change**

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At its meeting on Thursday, February 28, the Undergraduate Council voted to approve a proposal from the Geography Department for a new undergraduate Certificate in Climate Change. The proposal, with supporting materials, is attached.

We ask, if you also approve of the proposal, that it be forwarded on to the Executive Committee of the Academic Senate for their consideration.



THE UNIVERSITY OF UTAH  
**College of Science**

January 23, 2013

Undergraduate Council  
c/o Office of Undergraduate Studies  
Sterling Sill Center  
195 S. Central Campus Drive, RM 00132  
Salt Lake City, UT 84112

Dear Undergraduate Council Members:

I write to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change.

Dr. Brunelle's certificate program proposal has been reviewed by me and members of the Department of Biology and the College of Science. We feel an appropriate level of inclusion has been considered and that any impacts from the certificate to the department and/or the college will be positive.

Sincerely,

Pierre V. Sokolsky  
Dean, College of Science, and  
Distinguished Professor of Physics and Astronomy

January 13, 2013

Dear Undergraduate Council;

I am writing to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. The certificate program proposal has been reviewed by me and members of my college/department and we feel an appropriate level of inclusion and that any impacts from the certificate to my college/department will be positive.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. David Rudd', with a long horizontal stroke extending to the right.

M. David Rudd  
Dean

January 31, 2013

Dear Undergraduate Council;

I am writing to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. The certificate program proposal has been reviewed by me and members of my college/department and we feel an appropriate level of inclusion and that any impacts from the certificate to my college/department will be positive.

Certainly Dr. Brunelle has prepared a very strong case for this certificate. Nonetheless the Undergraduate Council may want to consider if the certificate should be housed in a single department or in a broader program such as Undergraduate Studies. Climate change has many facets, from science through political policy to law, and is intimately connected with energy usage by humans. Provision is made for addition of courses that will qualify for earning this certificate, and perhaps this is sufficient to accommodate departments that may develop interest in the certificate in the future.

Sincerely,



Francis H. Brown, Dean

To: Undergraduate Council

From: Dr. Kevin D. Perry, Chair  
Department of Atmospheric Sciences  
University of Utah

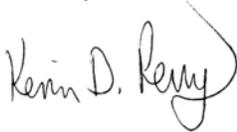
Date: January 31, 2013

Re: Letter of Support for the Climate Change Certificate

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I am writing to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. The certificate program proposal has been reviewed by me and members of my college/department and we feel an appropriate level of inclusion and that any impacts from the certificate to my college/department will be positive. In addition, I think that this interdisciplinary certificate program will be very popular with students from a wide variety of majors and colleges.

Sincerely,



Dr. Kevin D. Perry

January 13, 2013

Dear Undergraduate Council;

I am writing as the director of the Environmental and Sustainability Studies Program. I strongly endorse the proposal submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. This proposal has been carefully reviewed in detail by me and other affected programs and departments. This is an excellent option for our ENVST students, and I think it will be quite popular among our students.

Sincerely,



Daniel McCool  
Professor and Director



January 15, 2013

Dear Undergraduate Council;

I am writing to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. The certificate program proposal has been reviewed by me and members of the Department of Geography. We feel that this interdisciplinary certificate in the critical knowledge area of climate change is very worthwhile for U of U students.

Sincerely,

A handwritten signature in black ink that reads 'George F. Hepner'.

George F. Hepner, Professor and Chair

**Department of Geography**  
260 S. Central Campus Dr., Rm. 270  
Salt Lake City, Utah 84112-9155  
(801) 581-8218



February 19, 2013

Dear members of the Undergraduate Council:

I am writing in support of the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. This interdisciplinary curriculum brings together appropriate courses from a number of different departments under one umbrella. Faculty instructors of Biology courses included in the planned curriculum have reviewed the proposed certificate program and indicated their support. As such, we anticipate that any impacts associated with the implementation of the proposed certificate to the Department of Biology will be positive.

Sincerely,

Neil J. Vickers  
Professor & Chair, Department of Biology  
University of Utah  
Tel: (801)-585-1930  
Fax: (801)-581-2174  
[biochair.vickers@utah.edu](mailto:biochair.vickers@utah.edu)



January 15, 2013

Dear Undergraduate Council;

I am writing to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change. The certificate program proposal has been reviewed by me and members of the Department of Geography. We feel that this interdisciplinary certificate in the critical knowledge area of climate change is very worthwhile for U of U students.

Sincerely,

A handwritten signature in black ink that reads 'George F. Hepner'.

George F. Hepner, Professor and Chair

**Department of Geography**  
260 S. Central Campus Dr., Rm. 270  
Salt Lake City, Utah 84112-9155  
(801) 581-8218



THE UNIVERSITY OF UTAH  
**College of Science**

January 23, 2013

Undergraduate Council  
c/o Office of Undergraduate Studies  
Sterling Sill Center  
195 S. Central Campus Drive, RM 00132  
Salt Lake City, UT 84112

Dear Undergraduate Council Members:

I write to endorse the proposal being submitted by Dr. Andrea Brunelle for an Undergraduate Certificate in Climate Change.

Dr. Brunelle's certificate program proposal has been reviewed by me and members of the Department of Biology and the College of Science. We feel an appropriate level of inclusion has been considered and that any impacts from the certificate to the department and/or the college will be positive.

Sincerely,

Pierre V. Sokolsky  
Dean, College of Science, and  
Distinguished Professor of Physics and Astronomy