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) Code¹ (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):

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*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:

¹ 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.
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**

<table>
<thead>
<tr>
<th>All Program Courses</th>
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<tbody>
<tr>
<td><strong>Category</strong></td>
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<td>Sub-Total (minimum)</td>
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**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.

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<thead>
<tr>
<th>Semester 1</th>
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<tbody>
<tr>
<td>Fall (first core course)</td>
<td>GEOG 5205 or ATMOS 5400</td>
<td>Regional and Global Climates or The Climate System</td>
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<table>
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<tr>
<th>Semester 2</th>
<th>Course Prefix and Number</th>
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<tbody>
<tr>
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<td>GEOG 5210</td>
<td>Global Climate Change</td>
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<table>
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<th>Course Prefix and Number</th>
<th>Course Title</th>
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<td>GEOG 5215</td>
<td>Climate Change and Its Impacts</td>
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<td>XXXX</td>
<td>Elective 2</td>
</tr>
<tr>
<td></td>
<td>XXXX</td>
<td>Elective 3</td>
</tr>
</tbody>
</table>

The certificate as designed is meant 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  
Chair, Undergraduate Council

RE: New Undergraduate Certificate in Climate Change

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.
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,

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

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,

[Signature]

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,

George F. Hepner, Professor and Chair
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
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,

George F. Hepner, Professor and Chair
January 23, 2013

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c/o Office of Undergraduate Studies
Sterling Sill Center
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Sincerely,

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