Program Change Request

Date Submitted: 01/31/23 11:41 am

Viewing: SC-MS-CLIS : Climate Science, MS

Last approved: 02/08/22 12:02 pm

Last edit: 01/31/23 11:41 am

Changes proposed by: jbazaz

Catalog Pages Using this Program

Climate Science, MS

No Longer Anticipated closure Rationale for

Are you completing this form on someone else's behalf?

Yes

Requestor:

In Workflow

1. **AOES Committee**
2. **AOES Chair**
3. **SC Curriculum Committee**
4. SC Associate Dean
5. Assoc Provost-Graduate
6. Registrar-Programs

Approval Path

1. 01/31/23 6:29 pm Barry Klinger (bklinger): Approved for AOES Committee
2. 02/01/23 8:54 am Mark Uhen (muhen): Approved for AOES Chair

History

1. Dec 10, 2018 by Jennifer Bazaz Gettys (jbazaz)
2. Dec 10, 2018 by Tory Sarro (vsarro)
3. Mar 15, 2019 by Tory Sarro (vsarro)
4. Sep 9, 2019 by Tory Sarro (vsarro)
5. Jan 30, 2020 by Jennifer Bazaz Gettys (jbazaz)
6. Feb 23, 2021 by jriemen

7. Feb 8, 2022 by Jennifer Bazaz Gettys (jbazaz)

Name	Extension	Email
Barry Klinger	5302	bkinger

Effective Catalog: 2023-2024

Program Level: Graduate

Program Type: Master's

Degree Type: Master of Science

Title: Climate Science, MS

1. What was the process used wit
3. What evidence was used to iden
a. Have you ensured there are no ot
b. Has CRE confirmed the proposed b
c. Has the instructor(s) for this badge
f. Does this badge provide a benefit for
5. Is this badge co-sponsored with anothe
a. What is the organization, program, or d

Earning Criteria

Course:
Badge:
Participant:
Payment:
Portfolio:
Presentation:
Assessment:
Credential:
Education
Other:
Project:
Professional
Schedule/Registration:
Volunteer:

Skills Tag

Skills Tag

Badge Attributes

Please select one from each category
Achievement Type:
Mastery Level:
Time Commitment:
Cost:
Industry Standards:
Recommendations:

Issuance information and Pricing

Pricing: See https://cne.gmu.edu/digitalbadgepricing/ for more information

Estimated Number of Badges Expected to be Issued:

Notes:

- A Mason Digital Credentials Advisory Group may be developed to revi

Banner Title: MS Climate Science

Is this a retitling of an existing program? Existing Program

Registrar/OAPI Use Only – SCHEV Status Approved

Registrar's Office Use Only – Program Start Term Spring 2020

Registrar/OAPI Use Only – SCHEV Letter Climate Science MS.pdf

Registrar/OAPI Use Only – SACSCOC Status

Concentration(s):

	Associated Concentrations	Registrar's Office Use Only: Concentration Code
1	Climate Modeling	CM
2	Climate Data	CD

INTO Major(s):

Registrar/IRR Use Only – Concentration CIP Code

College/School: College of Science

Department / Academic Unit: Atmospheric, Oceanic, & Earth Sciences

Jointly Owned Program? No

Participating

Participating

Justification

What: Removing CSI 662 and replacing it with PHYS 660.

Why: CSI 662 has been inactivated.

Catalog Published Information

Total Credits Required: Total Credits: 33

Registrar's Office Use Only - Program Code:

SC-MS-CLIS

Registrar/IRR Use Only – Program CIP Code

Admission Requirements:

Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies section of this catalog.
To apply for this program, please complete the George Mason University Admissions Application.
Admission requirements include:

- An earned baccalaureate degree from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent, verified from official transcripts.
- A minimum 3.00 GPA on a 4.00 scale in baccalaureate study.
- Complete the online application and submit all required materials.

Program admission decisions give preference to students with an undergraduate degree in physical science, mathematics, or engineering. Students with other undergraduate degrees should consult with the program's administration regarding the suitability of their undergraduate preparation.

Program-Specific Policies:

Degree Requirements:

Students must complete the Core Courses, Seminar/Reading, and Thesis or Non-thesis sections, and in addition, choose one concentration:

Core Courses

CLIM 511	Atmospheric Dynamics 1	3
or CLIM 711	Introduction to Atmospheric Dynamics	
CLIM 512	Physical Oceanography 1	3
or CLIM 712	Physical and Dynamical Oceanography	
CLIM 610	Introduction to the Physical Climate System	3
CLIM 614	Land-Climate Interactions	3
CLIM 690	Scientific Basis of Climate Change	3
Total Credits		15

1Students who wish to continue with the Climate Dynamics, PhD should note that CLIM 711 Introduction to Atmospheric Dynamics and CLIM 712 Physical and Dynamical Oceanography are required for the PhD.

Seminar/Reading

CLIM 991	Climate Dynamics Seminar	1
Select 2 additional credits from the list below:		2
CLIM 796	Directed Reading and Research	
CLIM 991	Climate Dynamics Seminar	
CLIM 996	Doctoral Reading and Research	
Total Credits		3

Thesis or Non-thesis Options

Choose one of the following options:		3
Thesis Option		
CLIM 799	Master's Thesis in Climate	
Non-thesis Option		
Choose one unrestricted, graduate-level elective course [1]		
Total Credits		3

1Unrestricted, graduate-level elective courses may be chosen from the following prefixes: Climate Dynamics (CLIM), Mathematics (MATH), Computational and Data Sciences (CDS), Computational Science and Informatics (CSI), Computational Social Science (CSS), Geography and Geoinformation Science (GGS), or chosen from the Climate-Relevant elective list (below).

Other courses can be approved by the graduate coordinator.

Concentrations

Concentration in Climate Modeling (CM)

CLIM 670	Earth System Modeling	3
CLIM 715	Numerical Methods for Climate Modeling	3
CLIM 751	Predictability and Prediction of Weather and Climate	3
Choose one course from the elective lists (below)		3
Total Credits		12

Concentration in Climate Data (CD)

CLIM 680	Climate Data	3
CLIM 762	Statistical Methods in Climate Research	3
Choose two courses from the Mathematical, Computational, or Geographical elective list (below)		6
Total Credits		12

Electives

Please pay close attention to course credit values and consider how they will work into your degree program.

Climate Science

CLIM 631	Urban Climate
CLIM 680	Climate Data
CLIM 690	Scientific Basis of Climate Change
CLIM 713	Atmosphere-Ocean Interactions

CLIM 750 Geophysical Fluid Dynamics
CLIM 751 Predictability and Prediction of Weather and Climate
CLIM 752 Ocean General Circulation
CLIM 753 General Circulation of the Atmosphere
CLIM 754 Elements of the Tropical Climate System
CLIM 759 Topics in Climate Dynamics (when the topic is "Advanced Predictability" or "Convection") 2
GEOL 532 Paleoclimatology
GEOL 535 Quantitative Stratigraphy
GEOL 565 Paleoceanography
GGS 670 Introduction to Atmosphere and Weather

Mathematical, Computational, or Geographical

CLIM 715 Numerical Methods for Climate Modeling
CLIM 759 Topics in Climate Dynamics (when the topic is "Earth System Modeling") 2
CLIM 762 Statistical Methods in Climate Research
CLIM 763 Advanced Statistical Methods in Climate Research
GEOL 525 Modeling Earth Signals and Systems
GEOL 553 Field Mapping Techniques
CDS 501 Scientific Information and Data Visualization
CSI 501 Introduction to Scientific Programming
CSI 690 Numerical Methods
GGS 553 Geographic Information Systems
GGS 563 Advanced Geographic Information Systems
GGS 650 Introduction to GIS Algorithms and Programming
GGS 680 Earth Image Processing
GGS 692 Web-based Geographic Information Systems
PHYS 510 Computational Physics I

Climate-Relevant

GEOL 506 Soil Science
GEOL 513 Hydrogeology
GEOL 563 Coastal Morphology and Processes
BIOL 650 Environment Analysis and Modeling
CDS 502 Introduction to Scientific Data and Databases
CSI 600 Quantitative Foundations for Computational Sciences
~~CSI 662~~ ~~Introduction to Space Weather~~
EVPP 506 Science of the Environment I
EVPP 507 Science of the Environment II
EVPP 529 Environmental Science Communication
EVPP 542 Urban Ecosystems Processes
EVPP 543 Tropical Ecosystems
EVPP 550 Waterscape Ecology and Management
EVPP 607 Fundamentals of Ecology

EVPP 637	Human Dimensions of Climate Change (when the topic is "Climate Change Policy & Politics" or "Climate Change, Public Administration, and Management")
GGS 507	Geographic Approaches for Sustainable Development
GGS 531	Land-Use Modeling Techniques and Applications
GGS 550	Geospatial Science Fundamentals
GGS 579	Remote Sensing
GGS 656	The Hydrosphere
PHYS 660	**Space Weather**
AIT 580	Analytics: Big Data to Information
AIT 582	Metadata Analytics for Big Data
COMM 660	Climate Change and Sustainability Communication Campaigns
CS 504	Principles of Data Management and Mining
PUBP 710	Topics in Public Policy (when the topic is "Climate Policy & Politics" or "Climate Change, Public Administration and Management")

2 CLIM 759 Topics in Climate Dynamics is a special topics course in which different sections can address different subjects.

Retroactive Requirements Updates:

Plan of Study:

Honors Information:

Accelerated Description/Dual Degree Description:

INTO-Mason Requirements:

College Requirements & Policies:

Department / Academic Unit Requirements & Policies:

Program Outcomes

Additional Program Information

This information is required by the Office of Accreditation and Program Integrity.

Courses offered via distance (if applicable):

Indicate whether students are able

What is the primary delivery format for the program?

Face-to-Face Only

Does any portion of this program occur off-campus?

No

Off-campus details:

Are you working with a vendor / other collaborators to offer your program?

No

Please explain:

Related Departments

Could this program prepare students for any type of professional licensure, in Virginia or elsewhere?

No

Please explain:

Are you adding or removing a licensure component?

No

Please explain:

Additional SCHEV & SACSCOC Information

Is the content of the new program closely related to that of an existing approved program at the same instructional level (i.e., baccalaureate, master's, doctoral)?

Which existing approved program(s)?

Is this new program considered to be "advancing the degree level of a currently approved program" (i.e. existing content is at lower degree level, new content is at the higher degree

Which existing approved program(s)?

Is this new program considered to be "lowering the degree level of a currently approved program" (i.e. existing content is at higher degree level, new content is at the lower degree

Which existing approved program(s)?

Is this a re-opening of a program that was closed to admission within the last five years?

Date of Program Closure

What are the methods of delivery for the program?

Does this program include a course/credit-based competency-based education delivery option?

Is this change a simple retitling of an existing program, with no other changes, to any existing program content, curriculum requirements, etc?

No

Does this change represent a repackaging of content in an existing approved degree/certificate program at the same instructional level (i.e., baccalaureate, master's, or doctoral)?

No

Which existing approved program(s)?

Percentage of total credits containing new course content. ("New course content" is defined by SACSCOC as content that is not currently included in an existing approved degree/certificate program at the same instructiona level. Do not exclude gen ed credits in calculations for undergraduate programs.)

0%-24%

Does this change include the addition of a distance education or face-to-face method of delivery for this program

No

What is the new method of delivery?

Does this change include the addition of a course/credit-based competency-based education delivery option?

No

Will any additional equipment/facilities be needed?

No

Description of institutional impact:

Will any additional faculty be required?

No

Description of institutional impact:

Will any additional financial resources be needed?

No

Description of institutional impact:

Additional library/learning resources needed?

No

Description of institutional impact:

OAPI Use Only – Determination of SACSCOC Impact

Comments or Notes

Green Leaf Program Designation

Is this a Green Leaf program? No

Green Leaf Designation

Sustainability-focused academic programs require at least one green leaf course. Either that course is itself sustainability-focused or else the program requires a set of sustainability-related courses with aggregated

Relationship to Existing Courses

Relationship to Existing Programs

List sustainability-focused courses currently required in the degree

Sustainability-related academic programs either require at least one sustainability-related course or else offer any green leaf course as an option or elective. *

List sustainability-related courses currently required in the degree

Does this program cover material which crosses into another department?

No

Impacted Departments

Additional Attachments

SCHEV Proposal ClimateScienceMSProposalDraft.pdf

Executive Summary

The Master of Science (MS) in Climate Science will be offered by the Department of Atmospheric, Oceanic, and Earth Sciences (AOES) to be implemented in the Fall 2019 Semester. The MS will complement the existing BS in Atmospheric Science and PhD in Climate Dynamics offered by the department. It will educate students who can

conduct climate modeling experiments and diagnostic analyses at national centers; advise governments, corporations, and nongovernmental organizations on climate issues; and continue to doctoral studies in climate, atmospheric research, and related fields.

The degree requires 30 credits of course work and will have two concentrations, Climate Modeling and Climate Data. All students will take a 12 credit core of climate science classes, 6 credits of unrestricted electives, and 3 credits of seminar. Students can choose a thesis option (3 credits), or a non-thesis option in which an elective is substituted for thesis. The remaining 6 credit requirement is fulfilled in a different way by the two concentrations. Each will require a course specific to the concentration as well as an elective from a list specific to the concentration. The required courses and most electives have already been taught by AOES (including as special topics courses).

Reviewer Comments

Additional Comments

Is this course required of all students in this degree program?

%wi_required.eschtml%

Attached Document

Key: 720