

# Program Change Request

Date Submitted: 02/23/24 4:00 pm

Viewing: **SC-PHD-CSI : Computational Sciences and Informatics, PhD**

Last approved: 04/24/23 9:04 pm

Last edit: 03/13/24 2:45 pm

Changes proposed by: jbazaz

Catalog Pages  
Using this Program

[Computational Sciences and Informatics, PhD](#)

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

No

Effective Catalog: 2024-2025

Program Level: Graduate

Program Type: Doctoral

Degree Type: Doctor of Philosophy

Title:  
Computational Sciences and Informatics, PhD

Banner Title: Computat Sci & Informatics PhD

Registrar/OAPI Use Only – SCHEV Status Approved

Registrar’s Office Use Only – Program Start Term

Registrar/OAPI Use Only – SCHEV Letter

Registrar/OAPI Use Only – SACSCOC Status

In Workflow

1. CDS Chair
2. SC Curriculum Committee
3. SC Assistant Dean
4. Assoc Provost- Graduate
5. Registrar-Programs

Approval Path

1. 02/26/24 1:54 pm  
Jason Kinser  
(jkinser): Approved for CDS Chair

History

1. Oct 23, 2017 by clmig-jwehrheim
2. Feb 15, 2018 by rzachari
3. Mar 14, 2018 by pchampan
4. Jan 29, 2021 by Jennifer Bazaz Gettys (jbazaz)
5. Feb 23, 2021 by jriemen
6. Mar 3, 2021 by jriemen
7. Mar 5, 2021 by jriemen
8. Apr 27, 2022 by Jennifer Bazaz Gettys (jbazaz)
9. Jun 2, 2022 by Tory Sarro (vsarro)

**Concentration(s):****Registrar/IRR Use  
Only –  
Concentration CIP  
Code**

10. Apr 24, 2023 by

Jennifer Bazaz

Gettys (jbazaz)

**College/School:** College of Science**Department /  
Academic Unit:** Computational & Data Sciences**Jointly Owned  
Program?** No**Justification**

What: A new course, CSI 745 Robust Optimization for Decision Making, is added to the list of Areas of Emphasis Courses, which entail a requirement of 18 credits within the doctoral program.

Why: The CDS department has assessed that the new course CSI 745 is an excellent and valuable addition to the doctoral emphasis related to the optimization and data analysis included in the Computational Sciences and Informatics, PhD.

What: Referring applicants to central admissions language and removing extraneous wording.

Why: To make the program more adaptable to changes in university policies.

**Total Credits  
Required:** Total: 72 credits**Registrar's Office Use Only - Program Code:**

SC-PHD-CSI

**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. [International students and students having earned international degrees should also refer to Admission of International Students for additional requirements.](#)

~~To apply for this program, please complete the George Mason University Admissions Application.~~ **Eligibility**

Students interested in applying for admission should have a bachelor's degree in computational science, any natural science, mathematics, engineering, or computer science with a minimum GPA of 3.00 in their last 60 credits of [study](#)

from an institution of higher education accredited by a Mason-recognized U.S. study: institutional accrediting agency or international equivalent.

Applicants to the PhD program should have a mathematics background up to and including differential equations and should also have knowledge of a computer programming language such as C, C++, Fortran, Python, etc.

## Application Requirements

To apply for this program, prospective students should submit the George Mason University Admissions Application and its required supplemental documentation, two letters ~~The GRE is required, unless the applicant holds a master's degree from an institution of recommendation, a goals statement, and GRE scores unless the applicant holds higher education accredited by a~~ master's degree from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent.

~~institutional accrediting agency or international equivalent. An acceptable TOEFL score (as determined by the university) is required for international students; for more information visit the Admission of International Students section of the catalog. The ETS code for Mason is 5827. Students should submit a completed George Mason University Admissions Application along with two letters of recommendation, an expanded goals statement, and application fee in addition to the items listed above. Application deadlines can be found on the Office of Admissions website. For additional information, please contact the CSI graduate coordinator.~~

Program-Specific  
Policies:

## Policies

For policies governing all graduate programs, ~~degrees~~, see AP.6 Graduate Policies.

~~Reduction of Credit For students entering the doctoral program with a master's degree in a related field from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent, the required coursework may be reduced up to 24 credits, subject to approval of the graduate coordinator and the college's associate dean. Research-based courses and seminar courses are not eligible for reduction.~~ Transferring Previous Graduate Credit into this Program

Previously earned and relevant ~~Students who have prior~~ graduate credits coursework that has not been applied to any degree may be eligible for transfer into this program; details can be found ~~request to have a maximum of 30 of those graduate credits transferred, with approval of the graduate coordinator, the college's associate dean, and in the Credit by Exam or Transfer section of this catalog. accord with university policy: Please note that this program does not accept the transfer of previous research credits, including master's thesis credits.~~

~~Research-based courses and seminar courses are not eligible for transfer.~~

### Degree Requirements:

Students should refer to the [Admissions & Policies](#) tab for specific policies related to this program.

## General Core Courses

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Select two courses (6 credits) from the following: 6

[CSI 690](#) Numerical Methods

[CSI 695](#) Scientific Databases

[CSI 702](#) High-Performance Computing

[CSI 703](#) Scientific and Statistical Visualization

Total Credits 6

## Areas of Emphasis Courses

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Select 18 credits from the courses listed below. The selected courses may include 'General Core Courses' not applied toward those requirements.

Select six courses (18 credits) from the following: 18

[CSI 500](#) Computational Science Tools 1

or [CSI 501](#) Computational Science Programming

[CSI 672](#) Statistical Inference

[CSI 674](#) Bayesian Artificial Intelligence

[CSI 678](#) Times Series Analysis and Forecasting

[CSI 685](#) Fundamentals of Materials Science

[CSI 709](#) Topics in Computational Sciences and Informatics

[CSI 721](#) Computational Fluid Dynamics I

[CSI 740](#) Numerical Linear Algebra

[CSI 742](#) The Mathematics of the Finite Element Method

[CSI 745](#) [Robust Optimization for Decision Making](#)

[CSI 747](#) Nonlinear Optimization and Applications

[CSI 758](#) Visualization and Modeling of Complex Systems

[CSI 772](#) Data-Driven Modeling and Learning

[CSI 773](#) Statistical Graphics and Data Exploration

[CSI 777](#) Principles of Knowledge Mining

[CSI 780](#) Principles of Modeling and Simulation in Science

[CSI 782](#) Statistical Mechanics for Modeling and Simulation

[CSI 783](#) Computational Quantum Mechanics

[CSI 786](#) Molecular Dynamics Modeling

[CSI 873](#) Computational Learning and Discovery

Total Credits 18

1

Only one 500-level course may be applied toward the 18 credit requirement.

## Colloquium/Seminar

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The department offers weekly colloquia and seminar series to ensure that students are exposed to the latest developments at area research institutions. One credit may be chosen from:

[CSI 898](#) Research Colloquium in Computational Sciences and Informatics1

or [CSI 899](#) Colloquium in Computational and Data Sciences

Total Credits

1

## Electives

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Electives should be chosen to bring the total number of coursework credits to 48. Courses must be approved by the student's advisor and the graduate coordinator. Additionally,

- A maximum of 2 credits of [CSI 898](#) Research Colloquium in Computational Sciences and Informatics and/or [CSI 899](#) Colloquium in Computational and Data Sciences may be applied as electives.
- A maximum of two 500-level courses may be applied between both the 'Areas of Emphasis Courses' requirement and the 'Electives' requirement.
- [CSI 796](#) Directed Reading and Research and [CSI 996](#) Doctoral Reading and Research may be used as electives.
- The following courses may not be used as electives: [CSI 798](#) Practicum Project, [CSI 799](#) Master's Thesis, [CSI 998](#) Doctoral Dissertation Proposal, and [CSI 999](#) Doctoral Dissertation.
- Suggested elective courses include:
  - Any course in the 'Areas of Emphasis' not applied toward those requisites.
  - Other CSI courses such as: [CSI 739](#) Topics in Bioinformatics, [CSI 779](#) Topics in Computational Statistics, [CSI 789](#) Topics in Computational Physics, and [CSI 986](#) Advanced Topics in Large-Scale Physical Simulation.
  - Other interdisciplinary graduate courses across Mason's offerings. These courses should be chosen with the student's research supervisor for guidance on enhancing the student's ability to perform doctoral research within the emphases. Endorsement of the Computational and Data Sciences Department for applying these courses toward the 'Electives' requirement is required.

## Doctoral Research

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No more than 24 combined credits from [CSI 998](#) Doctoral Dissertation Proposal and [CSI 999](#) Doctoral Dissertation may be applied toward satisfying doctoral degree requirements, with a minimum of 6 credits of [CSI 999](#) Doctoral Dissertation.

Students become eligible to register for [CSI 998](#) Doctoral Dissertation Proposal upon having an approved dissertation committee. Upon advancement to candidacy, students will be eligible to register for [CSI 999](#) Doctoral Dissertation.

Select 24 credits from the following: 24

[CSI 998](#) Doctoral Dissertation Proposal

[CSI 999](#) Doctoral Dissertation

Total Credits

24

## Candidacy Examination

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The student must successfully complete separate written, computational, and oral candidacy examinations prepared and administered by the student's dissertation committee.

## Dissertation Proposal and Advancement to Candidacy

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Students advance to doctoral candidacy by fulfilling the following requirements:

- The student must successfully complete all coursework and candidacy examinations as stated above.
- The student prepares a dissertation proposal describing in detail the planned dissertation research. The proposal must be approved by the dissertation committee.
- Following successful completion of the research proposal and candidacy exams, the committee will recommend the student for advancement to doctoral candidacy to the graduate coordinator and the college's associate dean.

## Dissertation Research and Defense

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After advancing to candidacy, the student will work on a doctoral dissertation while enrolled in [CSI 999](#) Doctoral Dissertation. The dissertation is a written piece of original contribution that demonstrates a doctoral candidate's mastery of the subject matter. A student is expected to produce new and original research worthy of publication in peer-reviewed journals. After the dissertation is completed, the committee will review the dissertation and examine the student in a public oral dissertation defense.

**Retroactive  
Requirements  
Updates:**

**Plan of Study:**

**Program Outcomes**

## Additional Program Information

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

**Courses offered via  
distance (if  
applicable):**

**What is the  
primary delivery  
format for the  
program?**

Face-to-Face Only

**Does any portion of this program occur off-campus?**

No

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

No

**Related  
Departments**

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

No

**Are you adding or removing a licensure component?**

No

### **Additional SCHEV & SACSCOC Information**

**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

**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 instructional 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

**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

**Will any additional faculty be required?**

No

**Will any additional financial resources be needed?**

No

**Additional library/learning resources needed?**

No

## OAPI Use Only – Determination of SACSCOC Impact

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Comments or Notes

## Green Leaf Program Designation

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Is this a Green Leaf  
program?      No

Does this program cover material which crosses into another department?

No

Additional  
Attachments

SCHEV Proposal

Executive Summary

Reviewer  
Comments

Additional  
Comments

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

%wi\_required.eshtml%

Key: 25