# Program Change Request

Date Submitted: 01/09/23 12:12 pm

## Viewing: SC-BS-CDS : Computational and Data Sciences, BS

Last approved: 02/24/22 8:32 am

Last edit: 01/09/23 12:12 pm

Changes proposed by: jbazaz

**Catalog Pages Using this Program**

Computational and Data Sciences, BS

**No Longer Anticipated closure date (i.e., calendar**

**Rationale for**

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

Yes

**Requestor:**

| Name | Extension | Email |
|---|---|---|
| Estela Blaisten-Barojas | 1988 | blaisten@gmu.edu |

**Effective Catalog:** 2023-2024

**Program Level:** Undergraduate

**Program Type:** Bachelor's

**Degree Type:** Bachelor of Science

**Title:** Computational and Data Sciences, BS

**Approval Criteria**

1. What was the process used within your aca
2. Who was involved in approving the hedge?
3. What evidence was used to identify need/de

### In Workflow

1. **CDS Chair**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Undergraduate
5. Registrar-Programs

### Approval Path

1. 01/30/23 9:37 am Jason Kinser (jkinser): Approved for CDS Chair

### History

1. Oct 23, 2017 by clmig-jwehrheim
2. Feb 3, 2019 by Estela Blaisten-Barojas (blaisten)
3. Nov 13, 2020 by Tory Sarro (vsarro)
4. Feb 24, 2022 by Tory Sarro (vsarro)

a. Have you ensured there are no other existing b
b. Has CPE confirmed the proposed badge does not
c. Has the instructor(s) for this badge experience bee
d. Is there a contact hour minimum?
e. Is an assessment required?
f. Does this badge provide a benefit for current or
5. Is this badge co-sponsored with another organization, association, or unit? (If you would like an
a. What is the organization, program, or department

### 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://cpe.gmu.edu/digitalbadgepricing/ for more information*
Estimated Number of Badges Expected to be Issued:

## Notes:

- All badge requests will be routed to CPE for review and approval. Please allow 7
- A Mason Digital Credentials Advisory Group may be developed to review badge

| | |
|---|---|
| **Banner Title:** | Computational & Data Sci BS |
| **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** | |
| **Registrar/OAPI Use Only – SCHEV Letter** | |
| **Registrar/OAPI Use Only – SACSCOC Status** | |
| **Concentration(s):** | |
| **INTO Major(s):** | |
| **Registrar/IRR Use Only – Concentration CIP Code** | |
| **College/School:** | College of Science |
| **Department / Academic Unit:** | Computational & Data Sciences |
| **Jointly Owned Program?** | No |
| **Participating** | |
| **Participating** | |
| **Justification** | What:<br>The modification has 3 components that do not alter the required number of credits in each category:<br>1.The Extended Core list of courses is modified by adding 3 courses to the list as following<br>CDS 421 Computational Data Science<br>CDS 461 Molecular Dynamics and Monte Carlo Simulation<br>CDS 468 Image Operators and Processing<br>and eliminating in the current list the 2 courses below:<br>CDS 290 Topics in Computational and Data Sciences<br>CDS 486 Topics in Computational and Data Sciences<br><br>2.The Mason Core and Electives list of possibilities (attached as a PDF) is modified by eliminating 3 of the listed courses:<br>CDS 421 Computational Data Science<br>CDS 461 Molecular Dynamics and Monte Carlo Simulations<br>CDS 487 Electronic Structure Computations<br>and adding 3 different options:<br>Credits of any course listed in the Extended Core that were not applied toward the Extended Core 18- credit requirement.<br>CDS 290 Topics in Computational and Data Sciences<br>CDS 486 Topics in Computational and Data Sciences |

3. The 3 separate categories “Mathematical Courses,” “Statistic Courses,” “Science and Engineering Courses” are merged into one category termed Extended Multidisciplinary Core.

Why:
1-2. The proposed distribution of courses is based on the demand, content, and frequency of offering of the courses listed. With this modification, courses in the Extended Core have an assured yearly offering frequency. Meanwhile, the 2 topics courses (CDS 290, 486) moved to the Suggested Electives have uneven offering. The currently listed elective course CDS 467 has been deactivated. The new option added to the Suggested Electives of employing in this category any of the courses in the Extended Core list that were not applied toward the 18 required credits of that category is a clarification for students and advisor. This has been a defacto action over the last six years of renewed life of the CDS BS. As a note, this baccalaureate has now more than 200 students and is steadily growing.

3. The proposed merging of three types of requirements termed after the discipline of the courses (Mathematics, Statistics, Science & Engineering) is now simplified by creating one overarching category termed Extended Multidisciplinary Core. This simplification will help both the students and the department undergraduate advisor. As a note, the overall requirements of the three current categories are not affected. Namely, the total number of credits required and the list of courses offered are not changed.

### Catalog Published Information

| | |
|---|---|
| **Total Credits Required:** | Total credits: minimum 120 |
| **Registrar's Office Use Only - Program Code:** | SC-BS-CDS |
| **Registrar/IRR Use Only – Program CIP Code** | 51.2208 - Community Health and Preventive Medicine. |
| **Admission Requirements:** | |

# Admissions

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

**Program-Specific Policies:**

# Policies

Students must fulfill all Requirements for Bachelor's Degrees, including the Mason Core.
The university's writing intensive requirement for the major will be met upon successful completion of CDS 302 Scientific Data and Databases.

For policies governing all undergraduate programs, see AP.5 Undergraduate Policies.

**Degree Requirements:**

Students should refer to the Admissions & Policies tab for specific policies related to this program.

## Core Required Courses

| | | |
|---|---|---|
| CDS 130 | Computing for Scientists (Mason Core) | 3 |
| CDS 151 | Data Ethics in an Information Society (Mason Core) | 1 |
| CDS 230 | Modeling and Simulation I | 3 |
| CDS 301 | Scientific Information and Data Visualization | 3 |
| CDS 302 | Scientific Data and Databases 1 | 3 |
| CDS 303 | Scientific Data Mining | 3 |
| Total Credits | | 16 |

1 Fulfills the writing intensive requirement.

## Extended Core Courses

Select 18 credits from the following: 18

| | |
|---|---|
| CDS 101 | Introduction to Computational and Data Sciences (Mason Core) |
| & CDS 102 | and Introduction to Computational and Data Sciences Lab (Mason Core) |
| CDS 201 | Introduction to Computational Social Science |
| CDS 205 | Introduction to Agent-based Modeling and Simulation |
| CDS 251 | Introduction to Scientific Programming |
| ~~CDS 290~~ | ~~Topics in Computational and Data Sciences~~ |
| CDS 292 | Introduction to Social Network Analysis (Mason Core) |
| CDS 403 | Machine Learning Applications in Science |
| CDS 411 | Modeling and Simulation II |
| ~~CDS 486~~ | ~~Advanced Topics in Computational and Data Sciences~~ |
| **CDS 421** | **Computational Data Science** |
| **CDS 461** | **Molecular Dynamics and Monte Carlo Simulations** |
| **CDS 468** | **Image Operators and Processing** |
| CSI 500 | Computational Science Tools |
| CSI 501 | Introduction to Scientific Programming |

Total Credits 18

## Extended Multidisciplinary Core ~~Mathematics~~ Courses

**Mathematics**

Select 10-11 credits from the following: 10-11

| | |
|---|---|
| MATH 113 | Analytic Geometry and Calculus I (Mason Core) |
| MATH 114 | Analytic Geometry and Calculus II |
| MATH 125 | Discrete Mathematics I (Mason Core) |
| MATH 203 | Linear Algebra |
| MATH 446 | Numerical Analysis I |

**Statistics**

| | | |
|---|---|---|
| **Select 6 credits from the following:** | | **6** |
| **STAT 250** | **Introductory Statistics I (Mason Core)** | |
| **STAT 350** | **Introductory Statistics II** | |
| **STAT 344** | **Probability and Statistics for Engineers and Scientists I** | |
| **STAT 346** | **Probability for Engineers** | |
| **Science or Engineering** | | |
| **Select 6 credits from the following options:** | | **6** |
| **Additional Mason Core: Natural Science or Mason Core: Information Technology courses.** | | |
| **Any STEM course offered by the College of Science or the College of Engineering and Computing.** | | |
| Total Credits | | 22-23 |
| ~~Statistics Courses~~ | | |
| ~~Select 6 credits from the following:~~ | | ~~6~~ |
| ~~STAT 250~~ | ~~Introductory Statistics I (Mason Core)~~ | |
| ~~STAT 350~~ | ~~Introductory Statistics II~~ | |
| ~~STAT 344~~ | ~~Probability and Statistics for Engineers and Scientists I~~ | |
| ~~STAT 346~~ | ~~Probability for Engineers~~ | |
| ~~Total Credits~~ | | ~~0~~ |
| ~~Science and Engineering Courses~~ | | |
| ~~Select 6 credits from either one of the following:~~ | | ~~6~~ |
| ~~Additional Mason Core: Natural Science or Mason Core: Information Technology courses.~~ | | |
| ~~Any course offered by the College of Science or the College of Engineering and Computing.~~ | | |
| ~~Total Credits~~ | | ~~0~~ |

**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

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

**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 level)?**

**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 level)?**

**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, curriculu 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 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**

**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 substance equivalent to a sustainability-focused course.*

**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** Computational and Data Sciences, BS _ George Mason University.pdf

**SCHEV Proposal**

**Executive Summary**

**Reviewer Comments**

**Additional Comments**

**Is this course required of all students in this degree program?** %wi_required.eschtml%

**Attached Document** %attach_document.eschtml%

Key: 21