Program Approval Form

For approval of new programs and deletions or modifications to an existing program.

Action Requested:

- [ ] Create New (SCHEV approval required except for minors)
- [ ] Inactivate Existing
- [x] Modify Existing (check **ALL** that apply)
  - [ ] Title (SCHEV approval required except for minors)
  - [ ] **Concentration** (Choose one): [ ] *Add* [ ] *Delete* [x] *Modify*
  - [x] Degree Requirements
  - [ ] Admission Standards/ Application Requirements
  - [ ] Other Changes: _____

Type (Check one)**:**

- [ ] B.A. [x] B.S. [ ] Minor (req. C3 approval)
- [ ] M.A. [ ] M.S. [ ] M.Ed.
- [ ] Ph.D.
- [ ] Undergraduate Certificate* (req. C3 approval)
- [ ] Graduate Certificate*
- [ ] Bachelor's/Accelerated Master's [ ] Other:

College/School:	COS	**Department:**	Computational and Data Sciences
Submitted by:	Dimitrios Papaconstantopoulos	**Ext:** 3-3624	**Email:** dpapacon@gmu.edu

Effective Term: Fall 2016

Please note: For students to be admitted to a new degree, minor, certificate or concentration, the program must be fully approved, entered into Banner, and published in the University Catalog.

Justification: (attach separate document if necessary)

This program was previously inactivated but we recently received approval from SCHEV to activate it with curriculum updates

	Existing	New/Modified
Program Title: (Required) Title must identify subject matter. Do not include name of college/school/dept.	BS Degree in Computational and Data Sciences	BS Degree in Computational and Data Sciences
Concentration(s):		
Admissions Standards / Application Requirements: (Required only if different from those listed in the University Catalog)		
Degree Requirements: Consult University Catalog for models, attach separate document if necessary using track changes for modifications	See attached pages	See attached pages
Courses offered via distance: (if applicable)		
TOTAL CREDITS REQUIRED:	120	120

***For Certificates Only:** Indicate whether students are able to pursue on a [ ] **Full-time basis** [ ] **Part-time basis**

Approval Signatures

Department	Date	College/School	Date	Provost's Office	Date
	11/10/15				

Required for Minors and Interdisciplinary Programs

If this program may impact another unit or is in collaboration with another unit at Mason, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Minors and UG Certificates only (Cross-College Curriculum Committee Approval)

C3 Committee Member	Provost Office	C3 Committee Approval Date

For Graduate Programs Only

Graduate Council Member	Provost Office	Graduate Council Approval Date

For Registrar Office's Use Only: Received_____Banner_____Catalog_____

revised 7/1/15

Program Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference. Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

FOR ALL PROGRAMS (required)

Program Title: BS Degree in Computational and Data Sciences

Date of Departmental Approval: 11/10/2015

FOR MODIFIED PROGRAMS (required if modifying a program)

- Summary of the Modification: see attached
- Text before Modification (title, degree requirements, etc.): see attached
- Text after Modification (title, degree requirements, etc.): see attached
- Reason for the Modification:

This program was previously inactivated but we recently received approval from SCHEV to activate it with curriculum updates. We propose to delete the present concentrations in physics, chemistry, and biology, and abandon the concept of concentrations that limits the course selection choices of the students.

BS DEGREE IN COMPUTATIONAL AND DATA SCIENCES

The aim of the BS Degree in Computational and Data Sciences (CDS) is to provide students with the technical skillset and knowledge to rigorously investigate social and physical phenomena. This will be achieved in two ways. The first is the systematic development and application of computational techniques for modeling and simulation of scientific phenomena or social processes. The second is the systematic development and application of techniques for mining, managing, and analyzing large sets of data.

This approach is highly interdisciplinary and will lead to understanding, interpretation, and prediction of phenomena that traditional theory or experiment cannot provide alone. The educational and research directions pursued in the CDS degree are focused on providing our students with skills to be competitive in neighboring federal laboratories, scientific institutions, and high-technology firms and is a reflection of the present central role of computation in the arenas of "big data", and modeling and simulation.

Modified CDS BS Degree Program

In the new proposed curriculum plan, students enrolled in the BS degree in Computational and Data Sciences must complete 120 credit hours of coursework, including 45 credits in courses numbered 300 or above. We propose to delete the present concentrations in physics, chemistry, and biology, and abandon the concept of concentrations that limits the course selection choices of the students. Candidates for the BS degree in Computational and Data Sciences should satisfy the following degree coursework requirements:

A. CDS Core Required Courses: 16 credits

CDS 130 Computing for Scientists (3) (Included in the Mason Core)
CDS 151 Data Ethics in an Information Society (1) (Included in the Mason Core)
CDS 230 Modeling and Simulation I (3)
CDS 301 Scientific Information and Data Visualization (3)
CDS 302 Scientific Data and Databases (3) (Writing-intensive course)
CDS 303 Scientific Data Mining (3)

B. CDS Required Extended Core: Choose at least 18 credits from the following courses:

CDS 101 Introduction to Computational and Data Sciences (3) (Included in the Mason Core)
CDS 102 Introduction to Computational and Data Sciences Lab (1) (included in the Mason Core)
CDS 201 Introduction to Computational Social Science (3) New
CDS 205 Introduction to Agent-Based Modeling and Simulation (3) New
CDS 251 Introduction to Scientific Programming (3)
CDS 290 Topics in Computational and Data Sciences (3)
CDS 292 Introduction to Social Network Analysis (3) New
CDS 411 Modeling and Simulation II (3)
CDS 486 Advanced Topics in Computational and Data Sciences (3)
CSI 500 Computational Science Tools (3)
CSI 501 Introduction to Scientific Programming (3)

C. Mathematics Choose 10-11 credits from the following courses:

MATH 113 Analytic Geometry and Calculus I (4) (Included in the Mason Core)
MATH 114 Analytic Geometry and Calculus II(4)
MATH 125 Discrete Mathematics I (3)
MATH 203 Linear Algebra (3)
MATH 446 Numerical Analysis I (3)

D. Statistics: Choose 6 credits from the following courses:

STAT 250 Introductory Statistics I (3) (Included in the Mason Core)
STAT 350 Introductory Statistics II (3)
STAT 344 Probability and Statistics for Engineers and Scientists I (3)
STAT 346 Probability for Engineers (3)

E. Science and Engineering:

Choose 6 additional credits from ASTR, BIOL, CHEM, GEOL, EVPP, GGS, MATH, NEUR, PHYS-prefixed courses, or any course offered by the Volgenau School of Engineering.

F. Mason Core and Elective Credits (63-64 credits)
In order to meet a minimum of 120 credits, this degree requires an additional 63-64 credits, which may be applied towards any remaining Mason Core requirements, requirements for bachelor's degrees, and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

G. CDS Elective Course Suggestions

CDS 410/MATH 447 Numerical Analysis II (3)
CDS 421 Introduction to Computational Fluid Dynamics (3)
CDS 461 N-body Simulation Methods (3) to be changed to
Molecular Dynamics and Monte Carlo Simulations (3)
CDS 487 Electronic Structure Computations (3)
CDS 490 Directed Study and Research (1-3)
CDS 491 Internship (1-3)