



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

☒ Modify Existing (check **ALL** that apply)

☐ Title (SCHEV approval required except for minors)

☐ **Concentration** (Choose one): ☐ Add ☐ Delete ☐ Modify

☒ Degree Requirements

☐ Admission Standards/ Application Requirements

☐ Other Changes: _____

Type (Check one):

☐ B.A. ☐ 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

Submitted by:

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Department:

Computational and Data Sciences

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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)

Program Title: (Required)

Title must identify subject matter. Do not include name of college/school/dept.

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

Courses offered via distance:

(if applicable)

TOTAL CREDITS REQUIRED:

Existing	New/Modified
Computational Sciences and Informatics	
See attached pages	See attached pages
72	

*For Certificates Only: Indicate whether students are able to pursue on a

☐ Full-time basis

☐ Part-time basis

Approval Signatures

Department	9/4/15 Date	College/School	Date	Provost's Office Required for Minors and Interdisciplinary Programs	Date
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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: Computational Sciences PhD

Date of Departmental Approval: 9/4/2015

FOR MODIFIED PROGRAMS (required if modifying a program)

- Summary of the Modification:
Change in the course selection to fill the required 24 credits of CSI courses
- Text before Modification (title, degree requirements, etc.):

Currently the CSI PhD program has the following 48-credit requirement:

- 1) Requirement of four core courses (12 credits) selected from a list of five specific courses:
 - [CSI 690 - Numerical Methods](#)
 - [CSI 695 - Scientific Databases](#)
 - [CSI 701 - Foundations of Computational Science](#)
 - [CSI 702 - High-Performance Computing](#)
 - [CSI 703 - Scientific and Statistical Visualization](#)
- 2) Requirement of 24 additional credits selected from any CSI course in the catalog, excluding CSI 798, 799, 998, 999 and limiting to 2 credits maximum CSI 898 and/or CSI 991 seminar courses.
- 3) Requirement of 1 credit of seminar/colloquium from either CSI 898 or 991.
- 4) Electives courses for 11 credits that may or not have the CSI prefix and excluding CSI 798, CSI 799, CSI 998, CSI 999 or courses with other prefixes that pertain to master's thesis, master research project, and dissertation proposal and research. Electives should be approved by the advisor and the Graduate Coordinator.

- Text after Modification (title, degree requirements, etc.):

- 1) Requirement of two core courses (6 credits) selected from a list of four specific courses:
 - [CSI 690 - Numerical Methods](#)
 - [CSI 695 - Scientific Databases](#)
 - [CSI 702 - High-Performance Computing](#)
 - [CSI 703 - Scientific and Statistical Visualization](#)
- 2) Six required courses (18 credits) selected from a list of 35 CSI courses, not repeating the selected core courses, and including one 500-level course only:
 - CSI 500 - Computational Science Tools
 - CSI 501 - Introduction to Scientific Programming
 - CSI 654 - Data and Data Systems in the Physical Sciences
 - CSI 672 - Statistical Inference
 - CSI 674 - Bayesian Inference and Decision Theory
 - [CSI 676 - Regression Analysis](#)
 - [CSI 678 - Times Series Analysis and Forecasting](#)
 - [CSI 685 - Fundamentals of Materials Science](#)
 - [CSI 690 - Numerical Methods](#)
 - [CSI 695 - Scientific Databases](#)
 - CSI 701 - Foundations of Computational Science
 - CSI 702 - High-Performance Computing
 - CSI 703 - Scientific and Statistical Visualization
 - CSI 709 - Topics in Computational Sciences and Informatics

CSI 721 - Computational Fluid Dynamics I
CSI 739 - Topics in Bioinformatics
CSI 740 - Numerical Linear Algebra
CSI 742 - The Mathematics of the Finite Element Method
[CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences](#)
CSI 747 - Nonlinear Optimization and Applications
CSI 754 - Earth Science Data and Advanced Data Analysis
CSI 758 - Visualization and Modeling of Complex Systems
CSI 771 - Computational Statistics
CSI 772 - Statistical Learning
CSI 773 - Statistical Graphics and Data Exploration
CSI 777 - Principles of Knowledge Mining
CSI 780 - Computational Physics and Applications
[CSI 782 - Statistical Mechanics for Modeling and Simulation](#)
CSI 783 - Computational Quantum Mechanics
CSI 786 - Molecular Dynamics Modeling
CSI 787 - Computational Materials Science
CSI 788 - Simulation of Large-Scale Physical Systems
CSI 873 - Computational Learning and Discovery
CSI 876 - Measure and Linear Spaces
CSI 877 - Geometric Methods in Statistics

2) Requirement of 1 credit of seminar/colloquium from either CSI 898 or 991.

3) Electives courses for 23 credits approved by advisor and Graduate Coordinator excluding CSI 798, 799, 998, 999, limiting to a maximum of 2 credits of CSI 898 and/or CSI 991, allowing up to two 500-level courses if none was acquired in the CSI 25 credits requirement, and restricting research-based courses to CSI 796 and CSI 996 only.

- Reason for the Modification:

The five core courses were put in place during the setup of the program in 1991. However, over time the area of study and interests of the students have grown. Reducing the core to two courses is more appropriate leaving space for the students to select other courses to complete the 25 required credits of CSI-based coursework. The required additional 12 credits of CSI courses currently split into six different emphases can now be mixed among different concentrations. Overtime it has become apparent that there are two major emphases, Modeling & Simulation and Data Science, that allow a better guiding for the students. Therefore, the list of 35 selected courses is a more precise representation of these two emphases i.e. Modeling & Simulation and Data Science. These two emphases are now broader and therefore give more flexibility to the students by increasing the allowed elective credits and encouraging them to use the electives for the research-based courses CSI 796 and CSI 996.
