Program Guide

Department of Computational and Data Sciences
Doctoral Program in Computational Sciences and Informatics (CSI)

Spring 2021 version (Last update January 27, 2021)
Dear Student,

Welcome to the Computational Science and Informatics PhD program at Department of Computational and Data Sciences (CDS) at George Mason University.

In this guide, we explain some of the basics of being a student of the program. Below, you will find general guidance on what the program is about in practice, what you should expect and prepare for, and how to maximize the benefit of being here. There are some practical diagrams and tables, and suggested programs of study to help you get started.

It is important that you understand the official rules of the program as laid out in the University Catalog that corresponds to your term of admission or any subsequent change of catalog year you may request. Another important source of information is contained in the University Graduate Policies, which outline general rules that all graduate students at George Mason University must follow. Our program complies with both the College of Science and George Mason University rules. Students should also be mindful of the university calendar, updated regularly, which specifies a variety of information including dates for finals, dates for submission of important documents (including dissertations).

Important supplementary documents/links:
University Catalog for CSI PhD
GMU Academic Graduate Policies
COS graduate/faculty Handbook
University Calendars (part of the University Registrar’s website)

The CDS department website contains additional information
Department website
Computational and Data Sciences Department Officers

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Schematic of PhD requirements and approximate timeline

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<td>6 y</td>
<td>7 y</td>
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</table>

- **Core courses**
  - CSI 690, 695, 702, 703 (pick 2)

- **Emphasis Courses**
  - Pick 6 CSI courses (mind exclusions)

- **Electives**

- **Thesis credits**
  - CSI 998
  - CSI 999 (register until ready to defend)

- **Research/dissertation requirements**
  - Find research advisor (comm. chair)¹
  - Begin research
  - Form committee² (assisted by advisor/chair)
  - Candidacy exam (organized by chair)
    - Written + Comput
    - Oral
  - Proposal Defense
  - Advance to candidacy (GMU 6 years minus 1 semester limit)
  - Thesis defense (GMU 9 years minus 1 semester limit)

- **Admin forms**
  - Form 1: Program of study²
  - Reduction of Credit
  - Form 2
  - Form 3 and 4
  - Form 5
  - Last edit to Form 1, Form 5
  - Form 7

¹If research advisor is CDS core faculty, then he/she is also be committee chair. If not, a CDS core faculty is needed to be chair.

²CSI program Form 1

³Submit CSI program Form 2

*Gray shadow reflects approximate (but highly advisable) times. Note that the advancement to candidacy and dissertation defense deadlines are exact.*
Brief Description of the PhD Milestones

To complete the PhD program, students need to satisfy various requirements, schematically outlined in on “Schematic of PhD requirements and approximate timeline.” In summary, a student must complete:

1) coursework/credits requirements,
2) research activity supervised by their research adviser, and
3) general examinations which include, in order, the candidacy exam, doctoral dissertation proposal, and dissertation defense. These examinations require the formation of a dissertation committee.

These requirements have certain rules and need to be achieved in a certain sequence.

Coursework requirements and reduction of credit
These consist of a total of 72 credits distributed as follows: 6 core courses, 18 area of emphasis courses, 23 of elective courses, 1 of colloquium/seminar, and 24 dissertation credits obtained through CSI 998 and CSI 999 courses. Our PhD program admits a maximum reduction of 23 credits, based on the completion of relevant graduate coursework in another graduate degree. With few exceptions, these credits serve to reduce electives and colloquium credits.

Research requirement and research advisor
Although there is a large course requirement, a PhD is fundamentally a research degree. Students need to maintain this foremost in their planning. Students, part-time or full-time, should seek a research advisor promptly. Ideally, by the end of the first year after the start of their PhD, students should have explored supervision options and be finalizing arrangements with a research advisor. Students who delay in this process may encounter administrative complications and possible termination from the program due to various factors including an inability to meet certain university deadlines. Typically, research advisors should be chosen from among department faculty members, although in a few cases, a advisor from another department may be more appropriate.

To find a research advisor, discuss with several department faculty members whose research interests match yours. Mention any possible funding needs and opportunities in these discussion. It is also a good idea to discuss with each member their supervision expections, style, and even to discuss with their other current graduate students so that you know what to expect.

Your research advisor will help set up your dissertation committee (see rules on dissertation committee below which discuss the case of a advisor outside CDS), candidacy exam, dissertation proposal, and ultimately your dissertation and defense. Some of your coursework beyond the basic core courses and some area of emphasis courses should also be discussed with your research advisor.

Examinations
It is highly recommended that students take a proactive approach to completing these examinations in a timely manner. The rules for each of these examinations are explained in detail below.
Sources of Funding

University Presidential Fellowships (cover tuition, stipend including summers, and university health insurance):
These are available only to new PhD students who have not yet taken any courses of the PhD program. University Fellowships are offered for 4 years for students that received them in a fall term, and 3.5 years for students that receive them in the spring term. The university assigns each PhD program a limited number of these fellowships and, consequently, they are not always available to new students in a given admissions cycle.

Departmental teaching assistantships (cover tuition, stipend, and university health insurance):
The department is currently able to support a number of PhD students simultaneously via teaching assistantships (GTA), distributed equitably between the CSI and CSS PhD degrees (both offered by the CDS department). Any student holds a GTA for 1 year at a time. A GTA can be renewed on the basis of good simultaneous academic (course work and research) and teaching performance, and it is ultimately granted at the discretion of the department. It is current department policy to grant GTA positions only to those students who hold a prior MS or have completed at least 18 graduate credits as recognized by GMU. Also, only full-time students are eligible for GTA support. A student holding a GTA is considered to be enrolled full-time with 6 credit hours. This funding source requires initial college training when you first take it on (schedule of trainings is updated yearly and requires the recipient to be available before the start of the semester). Students holding assistantships may not engage in other on- or off-campus employment, including additional assistantships, during the period they hold an assistantship without explicit written approval from the department chair, program director, or dean.

Grant-based graduate research assistantships (cover 9 credits of tuition, stipend, and university health insurance):
Departmental faculty holding grants can support graduate research assistants, as allowable per grant, for varying periods. The grant Principal Investigator (PI) is the supervising entity, and the graduate researcher can work 20 hours per week, receives a stipend, 9 credits of in-state tuition and is eligible for health insurance. Graduate research positions are handled by the PI. In general, these assistantships are set up in 1-year increments, renewable on the basis of performance and funding. Students holding assistantships may not engage in other on- or off-campus employment, including additional assistantships, during the period they hold an assistantship without explicit written approval from the department chair, program director, or dean.

Departmental graduate lecturer positions (paid salary based on Mason adjunct faculty salary matrix):
The department hires graduate lecturers on an as-needed basis. It is current department policy to hire graduate lecturers only when students hold a prior MS or have completed at least 18 graduate credits as recognized by GMU. A graduate lecturer must be a student in good academic standing and hires are made based on a review of relevant qualifications not limited to academic standing. These positions are advertised via the departmental website and listservs.

Departmental graduate STARS positions (paid hourly wages):
The department hires between 2-4 graduate STARS (CDS Student Teaching Assistants) on an as-needed basis. The graduate STAR serves as an in-class
teaching assistant, helping students as needed via one-on-one methods, and assists
the instructor with grading homework assignments in lower-level classes. This
position pays an hourly rate salary based on hours worked per week. The graduate
STAR reports to the STARS program coordinator and is asked to attend meetings
and training, as required. These positions are advertised via the departmental
website and listservs.

**Provost Office grants for specific purposes or specific groups:**
The University Provost offers a number of funding opportunities for a variety of purposes and
groups. These funding sources are explained in detail at [https://provost.gmu.edu/academics-
and-research/graduate-education/awards-and-grants](https://provost.gmu.edu/academics-
and-research/graduate-education/awards-and-grants), and include grants for thesis completion,
travel, and access and inclusion.

**External funding sources:**
For students that do not have department or university support, it is encouraged that they seek
support from external funding bodies including NSF, foundations, private funders, or (for
foreign students) governments.

**Help with External Fellowship applications:**
The George Mason Office of Graduate Fellowships is an information and support center
dedicated to helping graduate students search for and apply to external fellowships that can
help them pay for their graduate studies. Consult with them if you are considering preparing
applications to external fellowships and/or sources of funding. Website:
[https://gradfellows.gmu.edu/](https://gradfellows.gmu.edu/)
Where to start each process

<table>
<thead>
<tr>
<th>Process</th>
<th>First point of contact</th>
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<tbody>
<tr>
<td>Filing program of study (preliminary)</td>
<td>CDS Academic Programs Administrator</td>
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<tr>
<td>Reduction of credit</td>
<td>CDS Academic Programs Administrator</td>
</tr>
<tr>
<td>General academic questions (e.g. more appropriate course)</td>
<td>Director of Graduate Studies or Research Advisor</td>
</tr>
<tr>
<td>General administrative questions (e.g. procedures to follow)</td>
<td>CDS Academic Programs Administrator</td>
</tr>
</tbody>
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Explanation of Course Requirements

The CSI PhD course credit requirements are divided in the following categories: core courses (6 credits), area of emphasis courses (at least 18 credits), electives (up to 23 credits), seminar/colloquium (1 to 3 credits), and dissertation credits (up to 24 credits of CSI 998 and CSI 999 with at least 6 credits of CSI 999).

A minimum of 72 credits are needed to complete the credit requirements of the PhD. It is allowed to complete more than 72 credits, but not advisable (cost, time).

**Core courses (6 credits)**
Choose two among CSI 690, CSI 695, CSI 702, and CSI 703

**Area of emphasis courses (at least 18 credits)**
A complete list of courses that count towards this category can be found in the catalog (https://catalog.gmu.edu/colleges-schools/science/computational-data-sciences/computational-sciences-informatics-phd/#requirementstext). This list can change over time (but not often). After choosing your two core courses, the other courses that could be chosen as core courses can count towards area of emphasis. Not all CSI coded classes can count towards area of emphasis (see below).

**Electives (up to 23 credits)**
These classes can be taken from among the list of valid area of emphasis classes, from other departments in the university, from universities that belong to the Consortium of Universities of the Washington Metropolitan Area (up to 6 credits), or be satisfied as part of a reduction (or transfer of credits). Combinations of these choices are valid to complete the needed credits.

**Seminar/Colloquium (1 credit, cannot be counted towards area of emphasis)**
These are taken as 1-credit semester classes and involve attending (generally) weekly seminars presenting current research from members of the department and beyond. Up to 3 credits can be used to satisfy the PhD credit requirement.

**Dissertation credits (up to 24 credits, with a minimum of 6 credits of CSI 999, cannot be counted towards area of emphasis)**
These are labeled CSI 998 and CSI 999. You can take CSI 998 once you have an approved dissertation committee. You are required to take a minimum of 6 credits of CSI 999. Once you have completed all other requirements, including the 72 credits, but are still working to complete your dissertation, you are considered registered full-time by registering 1 credit of CSI 999 per semester.

**Special and Remedial Courses (500-level count towards area of emphasis)**
Due to the diversity of backgrounds in the department, some students require preparatory courses to undertake the bulk of the PhD program. Students needing to quickly improve their programming skills are encouraged to take CSI 500 (Computational Science Tools) and CSI 501 (Introduction to Scientific Programming). Students needing to improve their general mathematical skills are encouraged to take CSI 600 (Quantitative Foundations of Computation Science) although the credits for this course cannot be counted towards the 72 credits of the PhD. In addition, the department offers special topic courses (normally new courses in trial), coded CSI 709. Per semester, there may be one, several, or none. Topics change.
Explanation of Candidacy Examination

The Candidacy Examination consists of a written, an oral, and (if applicable) a computational part. All parts are mandatory. The Candidacy Examination should determine mastery of fundamental knowledge and familiarity with current research in topics that contribute directly to the student’s dissertation research area.

Dissertation committee requirement
To organize the candidacy exam, a student must have identified a research advisor and formed a dissertation committee with the help of the advisor. In case the research advisor is not core faculty of the CDS department, the candidacy exam will require a committee chair that is CDS core faculty. If the research advisor is a CDS core member, then they also function as chair of the committee.

Recommendation of Timeline of Candidacy Exam
Students should aim to take their candidacy exams around 1.5 to 2 years from the start of the PhD (for full-time students) and around 2.5 to 3 years (part-time students). Practical considerations make it problematic to take the exams after 2.5 years for full-time students and 3.5 years for part-time students.

Exam rules and procedures
1) The composition of the Candidacy Examination is defined by a list of topics that are reasonably well understood in the scientific and technical community. Material covered may include content from courses taken by the student. After agreement is reached between the student and the committee, the list of exam topics and the proposed exam date are documented on Form #3, which is filed with the CDS office.
2) The written and computational parts of the exam must be submitted to the Director of Graduate Studies by the chair of the student’s committee at least one week prior to the examination.
3) The written portion will be administered and taken on campus and completed without collaboration, in a room assigned by the committee chair. The exam can be designed so that the student has the option of choosing a subset of questions to answer.
4) After completion of the written portion of the exam, the computational project is assigned, if applicable. In general, the student will have two weeks or less to complete the computational project.
5) The oral exam will be scheduled and administered by the committee, and can include discussion of the student’s computational project, the student’s proposed dissertation research, and the student’s performance on the written portion of the exam.
6) The Candidacy Examination is graded by the committee, which informs the student of the results in a timely manner. The entire exam process should be concluded within one semester.
7) Students have two opportunities to pass the Candidacy Examination. In some cases, only some parts of the exam may require retaking.

Results of Candidacy Examination
Upon successful completion of all parts of the exam, Form #4 is filled and signed by the committee members and the Director of Graduate Studies and added to the student’s file by the Academic Programs Administrator along with the graded exam.
Formation of Dissertation Committee

Current rules of the CSI PhD program require at least 4 members in the committee, satisfying the category of Mason Graduate Faculty. The following rules have to be observed:

1) At least two members of the committee must be core faculty members of the CDS department.
2) One member has to be the committee chair. The committee chair has to be a core faculty member of the CDS department. The committee chair has the responsibility of organizing examinations for the student.
3) If the student’s research advisor is a core faculty member of the CDS department, then this member is also the committee chair.
4) If a member of the committee is not a core faculty member of GMU, they must then be submitted for approval as Mason Graduate Faculty through the CDS office. This requires that the committee member possess a PhD, and a CV and possibly other documents are required to complete this process.
5) It is possible to have a fifth member in the dissertation committee. This is normally done when the student’s research can benefit from the expertise of an external member of the scientific community. Fifth members need approval of the Dissertation Chair and Director of Graduate Studies.

Who are core faculty members of CDS: The PhD program core faculty is composed of tenured and tenure-track members of the Mason faculty whose primary affiliations are with the CDS Department. Term faculty members of CDS can be committee chairs with written permission from the College of Science.
Doctoral Dissertation Proposal

Students must prepare a detailed Dissertation Proposal and present the proposal to their committee for approval. Proposals must be approved by the research advisor and the dissertation committee and will also be reviewed by the Director of Graduate Studies.

The proposal should contain sufficient text, illustrations, tables, equations, and bibliography to represent a clear explanation of the student’s proposed research project.

The proposal should include a detailed description of the work to be undertaken; its relation to previous published work; and the scientific, mathematical, and computational methods to be employed. Proposals should also include a clear set of goals, methods, and models, and a discussion of the expected results and their anticipated significance. The discussion should also include any limitations on the generality of the expected results.

Proposals should discuss hardware/software issues including computational tools, techniques, and algorithms to be utilized in the research.

An abstract of the dissertation proposal is submitted on Form #4.

Please note: Advancing to candidacy consists of the following:

- Finishing all coursework
- Passing candidacy exam
- Successfully defending dissertation proposal

Students admitted into the PhD program have six years minus one semester to advance. It is very important that the advancement forms are submitted to the academic programs administrator no later than the date given below. Forms submitted after this date are not guaranteed to be processed in time to meet the advancement deadline. Here are the deadlines for semester advancement:

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<th>SEMESTER</th>
<th>PAPERWORK DUE</th>
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<tr>
<td>Spring</td>
<td>November 8</td>
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<tr>
<td>Summer</td>
<td>March 8</td>
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<tr>
<td>Fall</td>
<td>May 25</td>
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</table>
Doctoral Dissertation

A dissertation is a written piece of original, independent work that demonstrates the doctoral candidate's mastery of the subject matter, methodologies, and conceptual foundations in their chosen field of study. Another term of the dissertation is a thesis.

The content of the dissertation should:
1) be relevant and current in the chosen research area,
2) demonstrate an understanding of theoretical/experimental research and, when applicable, development (as in R&D) issues,
3) demonstrate a mastery of computational tools and techniques,
4) make a research and/or development contribution through either new results and/or new techniques, and
5) be acceptable for publication in a refereed journal.

A pre-defense in front of the committee should take place a month prior to the dissertation defense. This allows the committee to make final recommendations and corrections to the student in preparation to the final public defense of the dissertation.

The final dissertation defense is done as a public presentation, arranged with the dissertation committee. Upon the successful completion of the defense, Form #7 is signed and completed by the student and dissertation committee, and submitted to the CDS office for further processing.

Note: The written dissertation volume must be submitted to the Library along with all approval signatures per their requirements and instructions. Guidelines for the content and general format of the doctoral dissertation may be found at https://library.gmu.edu/udts/process.
Checklist for Research Advisors (including Forms)

To help research advisor help their students remain in both good standing and making progress towards the completion of their PhD, the following list of recommendations is offered:

1) **Be aware of the your students Program of Study (CDS department Form 1):** this helps to keep an eye of a student’s progress and adherence to academic and research plans.

2) **Know your student’s deadlines:** be aware of the term they entered the program, how long they have to advance to candidacy and to graduate.

3) **Form your student’s committee early:** Since candidacy examination requires the dissertation committee to be formed, please do this with enough time to be ready for the candidate’s exam.

4) **Remember the steps involved in moving the student through the PhD requirements:**
   a. Form dissertation committee *(fill out CDS department Form 2)*
   b. Organize and administer candidacy exam *(fill out CDS department Forms 3 and 4)*; if you are not in CDS, coordinate with the committee chair who must be a CDS tenured or tenure track faculty member
   c. Organize Dissertation Proposal approval by the Dissertation Committee *(fill out CDS department Forms 5 and 6)*.
   d. Organize Pre-defense about a month before final dissertation defense.
   e. Organize Dissertation Defense *(fill out CDS department Form 7)*.
# Table of forms and requirements

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<thead>
<tr>
<th>Requirement</th>
<th>Form #</th>
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<tr>
<td>Program of study</td>
<td>1</td>
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<tr>
<td>Dissertation Committee</td>
<td>2</td>
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<td>Candidacy exam topics/date</td>
<td>3</td>
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<tr>
<td>Candidacy exam results</td>
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<tr>
<td>Dissertation Proposal abstract</td>
<td>4</td>
</tr>
<tr>
<td>Dissertation Proposal</td>
<td>5</td>
</tr>
<tr>
<td>Approval of Dissertation proposal and advancement to candidacy</td>
<td>6</td>
</tr>
<tr>
<td>Doctoral Defense</td>
<td>7</td>
</tr>
</tbody>
</table>

Where to find department forms
All department forms can be found on the CDS department [website](https://registrar.gmu.edu/).

Some other frequently used forms


**Reduction of Credit**: Students with a conferred MS/MA degree from a regionally accredited U.S. academic institution may be eligible for a reduction of credit [https://registrar.gmu.edu/wp-content/uploads/ROC.pdf](https://registrar.gmu.edu/wp-content/uploads/ROC.pdf)

**Substitution/Waiver**: Request that a requirement in an academic program be met by: 1) a transfer course even though not considered equivalent to a Mason course, or 2) a Mason course not usually applied to meet the requirement. Also, to request that, on some clearly detailed basis, a requirement in the student's academic program be waived (does not waive of give credit hours). [https://registrar.gmu.edu/wp-content/uploads/SWF_0514.pdf](https://registrar.gmu.edu/wp-content/uploads/SWF_0514.pdf)

For additional registrar forms, [https://registrar.gmu.edu/forms/](https://registrar.gmu.edu/forms/)
Suggested Preliminary Programs of Study by student’s areas of interest

HOW TO USE THESE TEMPLATES:
Two templates (below) are provided in this guide to help students begin the process of creating their own Programs of Study. One template is for students with interest in Data Science, and the other for students interested in Modeling and Simulation.

Once the tentative plan is completed, fill it out in a blank Form 1 and hand it in to the Program Administrator for processing. Any academic questions should be addressed to the Director of Graduate Studies.

Complete this template within the first 4 weeks in the PhD.

The core courses in each template are aligned with each of the two possible areas of interests and are therefore suggested to be taken as indicated.

The area of emphasis courses allow more flexibility and depend on the student’s research interests. The courses in each template are those with widest general interest for each area. However, before advancement to candidacy, the courses can be substituted by others that more closely match the student’s research interests, and should be discussed and revised with the student’s research advisor. Changes are possible and even encouraged on the basis of research direction. In some cases, it may be decided that a student should take more than 18 credits of area of emphasis, which would reduce the credits needed in electives and also credits that can be reduced or transferred from graduate work prior to joining the CSI PhD. An updated list of the courses with CSI codes taught in recent years is attached and updated every term to help create a program of study.

Elective courses: Elective courses should generally be used to emphasize or complement training in relevant areas and techniques that students require for their dissertation. Reduced/transferred credits are almost always counted towards electives and are explicitly written into the program of study. Taking CSS courses counts as elective courses.

Remedial skills courses: Students requiring courses to improve or refresh their programming/quantitative skills should consider CSI 500 (Computational Science Tools) which teaches scientific packages such as R, and CSI 501 (Introduction to Scientific Programming) which focuses on programming languages. Only one 500 level course will count towards the 48 coursework credits. CSI 600 and undergrad level courses will not count for credit. However, if the material is needed it is advisable to take such courses even if credits are not counted.

Admissions with Provisions: The proposed program of study of students provisionally admitted needs to include all the courses in the provisions in the first 2 semesters. Follow the rest of this guidance for all other courses.

Semester each course is to be taken: The list of courses taught in recent years should help frame a tentative timeframe. Some courses are taught in the Fall, some in Spring, and some are taught in non-consecutive years. All such details must be considered. Please also consider this on courses from other departments.
# PROPOSED COURSEWORK (DATA SCIENCE TEMPLATE)

<table>
<thead>
<tr>
<th>Core Requirements (6 credits)</th>
<th>Cred Hrs</th>
<th>Institution</th>
<th>Semester</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>CSI 695 Scientific Databases</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td>CSI 703 Scientific &amp; Statistical Viz</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td><strong>Areas of Emphasis (18 credits)</strong></td>
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<tr>
<td>CSI 672(^1) Statistical Inference</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td>CSI 674(^2) Bayesian Infer Decis Theor</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td>CSI 678(^3) Time Series Analys Forecast</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td>CSI 775(^4) Graph Mod for Decis Making</td>
<td>3</td>
<td>GMU</td>
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<tr>
<td>CSI 777 Princpls of Knowledge Mining</td>
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<tr>
<td>CSI 873 Comp Learn and Discovery</td>
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<tr>
<th>Electives (23 credits)</th>
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<tr>
<th>Seminar/Colloquium (up to 1 credits)</th>
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<tr>
<th>Dissertation Requirements (24 credits with minimum of 6 999s)</th>
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<tbody>
<tr>
<td>CSI 998 – Doctoral Dissertation Proposal</td>
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<tr>
<td>CSI 998 – Doctoral Dissertation Proposal</td>
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<tr>
<td>CSI 998 – Doctoral Dissertation Proposal</td>
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<tr>
<td>CSI 999 – Doctoral Dissertation</td>
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<td>CSI 999 – Doctoral Dissertation</td>
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</tbody>
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\(^1\) Crosslisted as STAT 652  
\(^2\) Crosslisted as OR 664/SYST 664  
\(^3\) Crosslisted as STAT 658  
\(^4\) Crosslisted as OR 719
## PROPOSED COURSEWORK (MODELING TEMPLATE)

### Core Requirements (6 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Cred Hrs</th>
<th>Institution</th>
<th>Semester</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI 690 Numerical Methods(^1)</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 702 High Performance Computing</td>
<td>3</td>
<td>GMU</td>
<td></td>
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</tbody>
</table>

### Areas of Emphasis (18 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Cred Hrs</th>
<th>Institution</th>
<th>Semester</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI 678 Time Series Anlys Forecast</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 695 Scientific Databases</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 703 Scientific &amp; Statistical Viszl</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 747 Nonlinear Optimization Apps</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 758 Visualiz/Model Complex Sys</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSI 786 Molecular Dynamics Model</td>
<td>3</td>
<td>GMU</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Electives (23 credits)

| Seminar/Colloquium (up to 1 credits) | 1 |

### Dissertation Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Cred Hrs</th>
<th>Institution</th>
<th>Semester</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI 998 up to 18 credits plus</td>
<td>24</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CSI 999 minimum of 6 credits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Crosslisted with MATH 685/OR 682

\(^2\) Crosslisted with
Reductions and Transfers of Credit

Reductions of credit are a process by which a student who has completed another graduate degree before joining the PhD can request that credits from that prior degree be accepted in lieu of required credits in the CSI PhD.

Transfers of credit are a process by which a student who has taken graduate level courses that do not form part of a graduate degree before joining the PhD can request that those credits be accepted in lieu of required credits in the CSI PhD.

Rules for reductions and transfers:

1) normally granted towards the electives and colloquium credit requirement,
2) limited to a maximum of 23 credits,
3) for every course used as part of a reduction or transfer request, the course syllabus must be submitted, and
4) the process should be done in the first year of the student’s study.

This process should be initiated with the Academic Programs Administrator.
Courses outside of CSI currently waived as CSI

Due to shifts in faculty coverage and departmental priorities, these courses are currently waived as CSI courses and are eligible to be area of emphasis courses in the CSI PhD.

CSI 672/STAT 652 Statistical Inference
CSI 773/STAT 663 Statistical Graphics and Data Exploration

This list is subject to change at any time. Having been admitted in a semester when this waiver is in place does not constitute a permanent waiver, and students will need to receive approval from the CSI PhD graduate coordinator to include these courses in their program of study area of emphasis credits.
<table>
<thead>
<tr>
<th>Actions</th>
<th>Fall</th>
<th>Spring</th>
<th>Summer</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>File to graduate</td>
<td>Check out Registrar’s website for deadlines for online and paper applications: <a href="https://registrar.gmu.edu/students/graduation/timelines/">https://registrar.gmu.edu/students/graduation/timelines/</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Draft Dissertation to Committee Chair</td>
<td>1st week of August</td>
<td>1st week of December</td>
<td>1st week of March</td>
<td></td>
</tr>
<tr>
<td>Draft to Committee</td>
<td>1st week of September</td>
<td>1st week of January</td>
<td>1st week of April</td>
<td></td>
</tr>
<tr>
<td>Predefend</td>
<td>1st week of October</td>
<td>1st week of March</td>
<td>1st week of June</td>
<td>Poll committee members to get date/time then let Academic Programs know so she can schedule a room for predefense</td>
</tr>
<tr>
<td>Defend</td>
<td>Mid November</td>
<td>1st week of April</td>
<td>1st week of July</td>
<td>Same as above.</td>
</tr>
<tr>
<td>Dissertation Title and Abstract to Academic Programs Manager for advertising the defense</td>
<td>Minimum of 2 weeks before defense</td>
<td>Minimum of 2 weeks before defense</td>
<td>Minimum of 2 weeks before defense</td>
<td>You will be sent a template when the time comes to prepare your defense announcement.</td>
</tr>
<tr>
<td>Submit Dissertation to Library</td>
<td>Check out library’s website for submission procedures and deadlines: <a href="http://library.gmu.edu/udts">http://library.gmu.edu/udts</a></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Spring 2020
CSI 500 Computational Science Tools (Stephen L Scott)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 674/OR 664/SYST 664 Bayesian Inference & Decision Theory (Kathryn Laskey)
CSI 678/STAT 658 Time Series Analysis and Forecasting (Olga Gkountouna)
CSI 702 High-performance Computing (Swabir Silayi)
CSI 703 Scientific and Statistical Visualization (Michael Eagle)
CSI 742 Math of Finite Element Method (Dhafer Marzougui)
CSI 783 Statistical Mechanics for Modeling and Simulation (Estela Blaisten-Barojas)
CSI 786 Molecular Dynamics Modeling (Estela Blaisten-Barojas)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)
CSI 986 Large Scale Molecular Simulations (Estela Blaisten-Barojas)

Fall 2019
CSI 500 Computational Science Tools (Stephen L Scott)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 600 Quantitative Foundations for Computational Sciences (Yue Xie)
CSI 678/STAT 658 Time Series Analysis and Forecasting (Tucker McElroy)
CSI 690/MATH 685/OR 682 Numerical Methods (Estela Blaisten-Barojas)
CSI 695 Scientific Databases (Robert Brown)
CSI 711/CHEM 633 Chemical Thermodynamics and Kinetics (Mosissa Fayissa)
CSI 777 Principles of Knowledge Mining (William G Kennedy)
CSI 780 Principles of Modeling and Simulation (Estela Blaisten-Barojas)
CSI 873 Computational Learning and Discovery (Igor Griva)

Spring 2019
CSI 500 Computational Science Tools (Stephen L Scott)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 674/OR 664/SYST 664 Bayesian Inference & Decision Theory (Kathryn Laskey)
CSI 702 High-performance Computing (James Glasbrenner)
CSI 703 Scientific and Statistical Visualization (Michael Eagle)
CSI 709 Special Topics: Exponential Random Graph Models (Eduardo López)
CSI 742 Math of Finite Element Method (Dhafer Marzougui)
CSI 758 Visualization and Modeling of Complex Systems (Jason Kinser)
CSI 783 Statistical Mechanics for Modeling and Simulation (Estela Blaisten-Barojas)
CSI 786 Molecular Dynamics Modeling (Estela Blaisten-Barojas)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)
CSI 986 Large Scale Molecular Simulations (Estela Blaisten-Barojas)

Fall 2018
CSI 500 Computational Science Tools (Stephen L Scott)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 600 Quantitative Foundations for Computational Sciences (Yue Xie)
CSI 678/STAT 658 Time Series Analysis and Forecasting (Tucker McElroy)
CSI 685 Fundamentals of Material Science (Hongwei Sheng)
CSI 690/MATH 685/OR 682 Numerical Methods (Estela Blaisten-Barojas)
CSI 695 Scientific Databases (Nektaria Tryfona)
CSI 709 Topics Class: Exponential Random Graph Models (Eduardo López)
CSI 711/CHEM 633 Chemical Thermodynamics and Kinetics (Mosissa Fayissa)
CSI 720 Fluid Mechanics (Robert A Handler)
CSI 721 Computational Fluid Dynamics (Rainald Lohner)
CSI 747 Nonlinear Optimization and Applications (Igor Griva)
CSI 777 Principles of Knowledge Mining (William G Kennedy)
CSI 780 Principles of Modeling and Simulation (Estela Blaisten-Barojas)

Spring 2018
CSI 500 Computational Science Tools (Stephen L Scott)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 674/OR 664/SYST 664 Bayesian Inference & Decision Theory (Kathryn Laskey)
CSI 702 High-performance Computing (James Glasbrenner)
CSI 703 Scientific and Statistical Visualization (Edward J Wegman)
CSI 720 Fluid Mechanics (Robert A Handler)
CSI 740 Numerical Linear Algebra (Igor Griva)
CSI 742 Mathematics of Finite Element Methods (Chi Yang)
CSI 783 Computational Quantum Mechanics (Estela Blaisten-Barojas)
CSI 789 Image Operators and Analysis (Jason Kinser)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)
CSI 986 Large Scale Molecular Simulations (Estela Blaisten-Barojas)

Fall 2017
CSI 500 Computational Science Tools (Stanley Zoltek)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 597 Topics in Science & Engineering Simulation (Claudio Cioffi-Revilla)
CSI 600 Quantitative Foundations for Computational Sciences (Thomas M Clemons)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 690/MATH 685/OR 682 Numerical Methods (Dmitri Klimov)
CSI 695 Scientific Databases (Matthias Renz)
CSI 711/CHEM 633 Chemical Thermodynamics and Kinetics (Mosissa Fayissa)
CSI 773/STAT 663 Statistical Graphics and Data Exploration (Daniel B Carr)
CSI 777 Principles of Knowledge Mining (William G Kennedy)
CSI 780 Principles of Modeling and Simulation (Estela Blaisten-Barojas)
CSI 782 Statistical Mechanics for Modeling and Simulation (Estela Blaisten-Barojas)
CSI 873 Computational Learning and Discovery (Igor Griva)
CSI 971 Probability Theory (William F Rosenberger)
CSI 972 Mathematical Statistics (Anand N Vidyashankar)

Spring 2017
CSI 501 Introduction to Scientific Programming (Blaisten, Daniel Ray Sponseller)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 702 High-performance Computing (James Glasbrenner)
CSI 703 Scientific and Statistical Visualization (Edward J Wegman)
CSI 740 Numerical Linear Algebra (Daniel Anderson)
CSI 758 Visualization and Modeling of Complex Systems (Jason Kinser)
CSI 775/OR 719 Graphical Models for Inference and Decision Making (Kathryn B Laskey)
CSI 786 Molecular Dynamics Modeling (Estela Blaisten-Barojas)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)

Fall 2016
CSI 500 Computational Science Tools (Stanley Zoltek)
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)

23
CSI 600 Quantitative Foundations for Computational Sciences (Thomas M Clemons)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 678/STAT 658 Time Series Analysis and Forecasting (James Livsey)
CSI 690/MATH 685/OR 682 Numerical Methods (Dmitri Klimov)
CSI 695 Scientific Databases (Matthias Renz)
CSI 747 Nonlinear Optimization and Applications (Igor Griva)
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CSI 777 Principles of Knowledge Mining (Edward Wegman)
CSI 780 Principles of Modeling and Simulation (Estela Blaisten-Barojas)
CSI 971 Probability Theory (William F Rosenberger)
CSI 972 Mathematical Statistics (Anand N Vidyashankar)
CSI 986 Large Scale Physical Simulations (Estela Blaisten-Barojas)

Spring 2016
CSI 501 Introduction to Scientific Programming (Daniel Ray Sponseller)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 674/OR 664/SYST 664 Bayesian Inference & Decision Theory (Kathryn Laskey)
CSI 702 High-performance Computing (Estela Blaisten-Barojas)
CSI 703 Scientific and Statistical Visualization (Edward J Wegman)
CSI 740 Numerical Linear Algebra (Thomas Wanner)
CSI 772 Statistical learning (James E Gentle)
CSI 783 Computational Quantum Mechanics (Estela Blaisten-Barojas)
CSI 787 Computational Materials Science (Dimitrios Papaconstantopoulos)
CSI 877 Geometric Methods In Statistics (Edward Wegman)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)

Fall 2015
CSI 500 Computational Science Tools (Stanley Zoltek)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 676 Regression Analysis (John J Miller)
CSI 685 Fundamentals of Material Science (Hongwei Sheng)
CSI 690/MATH 685/OR 682 Numerical Methods (Dmitri Klimov)
CSI 695 Scientific Databases (Jason Kinser)
CSI 771 Computational Statistics (James Gentle)
CSI 773/STAT 773 Statistical Graphics and Data Exploration (Daniel B Carr)
CSI 780 Computational Physics and Applications (Estela Blaisten-Barojas)
CSI 782 Statistical Mechanics for Modeling and Simulation (Estela Blaisten-Barojas)
CSI 873 Computational Learning and Discovery (Igor Griva)
CSI 876 Measures and Linear Spaces (Edward Wegman)
CSI 971 Probability Theory (William F Rosenberger)
CSI 972 Mathematical Statistics (Anand N Vidyashankar)

Spring 2015
CSI 501 Introduction to Scientific Programming (Fernando E Camelli)
CSI 655 Atmospheric Physics I (Michael E Summers)
CSI 662 Introduction to Space Weather (Erdal Yigit)
CSI 672/STAT 652 Statistical Inference (Clifton D Sutton)
CSI 674/OR 664/SYST 664 Bayesian Inference & Decision Theory (Kathryn Laskey)
CSI 690 Numerical Methods (Igor Griva)
CSI 702 High-performance Computing (Rainald Lohner)
CSI 703 Scientific and Statistical Visualization (Edward J Wegman)
CSI 742 Mathematics of Finite Element Methods (Chi Yang)
CSI 772 Statistical learning (James E Gentle)
CSI 783 Computational Quantum Mechanics (Estela Blaisten-Barojas)
CSI 786 Molecular Dynamics Modeling (Estela Blaisten-Barojas)
CSI 789 Nonlinear Finite Element Methods (Dhafer Marzougui)
CSI 973 Mathematical Statistics II (Anand N Vidyashankar)
Useful Resources/Contacts

Graduate admissions
masongrad@gmu.edu
703-993-9700
Office Location: 213 Johnson Center (2nd Floor)

Director of Graduate Programs, College of Science
Melissa Hayes
cosgrad@gmu.edu
Suite 1450 Exploratory Hall
703-993-9532
mhayes5@gmu.edu

Office of International Programs and Scholars
(703) 993 2970
https://oips.gmu.edu/

Student Health Services
703-993-2831
https://shs.gmu.edu/

Counseling and Psychological Services
703-993-2380
https://caps.gmu.edu/

Disability Services
703-993-2474
https://ds.gmu.edu/

Office of Compliance, Diversity, and Ethics
(703) 993-1000
https://diversity.gmu.edu/title-ix

Office of the University Registrar (including FERPA)
703-993-2441
https://registrar.gmu.edu/

University Library
703-993-2240
https://library.gmu.edu/

Stearn Center Student Support Resources Webpage
Many of the links above, as well as many other University offices and resources useful students can be found in the link below
https://stearnscenter.gmu.edu/knowledge-center/knowing-mason-students/student-support-resources-on-campus/