Course Approval Form

Action Requested:

[X] Create new course   [ ] Inactivate existing course

[x] Modify existing course (check all that apply)

[ ] Title	[ ] Credits	[ ] Repeat Status [ ] Grade Type
[x] Prereq/coreq	[ ] Schedule Type	[ ] Restrictions
[x] Other:	Change number from CSI 873 to CSI 673 and delete CSI 873	

Course Level:

[ ] Undergraduate

[x] Graduate

College/School: College of Science   **Department:** CDS

Submitted by: D. Papaconstantopoulos   **Ext:** 3-3624   **Email:**

Subject Code: CSI   **Number:** 673   **Effective Term:** [x] Fall [ ] Spring [ ] Summer   *Year* 2016

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Title:

Current: Computational Learning and Discovery

Banner (30 characters max w/ spaces): Computation Learning Discovery

New:

Fulfills Mason Core Req? (undergrad only)

[ ] Currently fulfills requirement

[ ] Submission in progress

Credits: (check one)   [3] Fixed or [ ] Variable to

Repeat Status: (check one)

[ ] Not Repeatable (NR)

[ ] Repeatable within degree (RD)

[ ] Repeatable within term (RT)

Maximum credits allowed:

Grade Mode: (check one)

[x] Regular (A, B, C, etc.)

[ ] Satisfactory/No Credit

[ ] Special (A, B C, etc. +IP)

Schedule Type: (check one) LEC can include LAB or RCT

[x] Lecture (LEC)   [ ] Independent Study (IND)

[ ] Lab (LAB)   [ ] Seminar (SEM)

[ ] Recitation (RCT)   [ ] Studio (STU)

[ ] Internship (INT)

Prerequisite(s):

CDS 303 or equivalent, or permission of instructor

Corequisite(s):

Instructional Mode:

[x] 100% face-to-face

[ ] Hybrid: ≤ 50% electronically delivered

[ ] 100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc**.** (include code)

Equivalencies: (check only as applicable)

[ ] YES, course is 100% equivalent to:

[x] YES, course is being renumbered to/will replace the following: CSI 873

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	**Notes** (List additional information for the course)
Presents modern ideas, theories, and methods for computational learning and discovery, along with relevant applications including medical diagnosis, Earth science data analysis, and neuronal modeling. Includes background elucidation of fundamental concepts in computational learning, addressing discovery of equations, theory of causality, and comparison with biological and cognitive models. Students make presentations on topics of their research interest and work on projects involving state-of-the art systems.	

Indicate number of contact hours: Hours of Lecture or Seminar per week: 3   Hours of Lab or Studio:

When Offered: (check all that apply)   [x] Fall [ ] Summer [ ] Spring

Approval Signatures

Department Approval	Date
College/School Approval	Date

If this course includes subject matter currently dealt with by any other units, 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 Graduate Courses Only

Graduate Council Member	Provost Office	Graduate Council Approval Date

For Registrar Office's Use Only: Banner_____Catalog_____   *revised 6/22/15*

Course 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 COURSES

Course Number and Title: CSI 673- Computational Learning and Discovery

Date of Departmental Approval: <mark>10/14/2015</mark>

FOR MODIFIED COURSES

- Summary of the Modification:
  Re-numbering the course, which implies deleting 873 and creating the new 673
- Text before Modification (title, repeat status, catalog description, etc.): CSI 873

- Text after Modification (title, repeat status, catalog description, etc.): CSI 673

- Reason for the Modification: The new number corresponds to the level at which this course has been taught. The original number was given many years ago when the program did not want to have 600-level courses and the 700 level courses in the area 770-779 were all used. Current syllabus is included:

CSI 873 Computational Learning and Discovery

Instructor: Igor Griva, igriva@gmu.edu , (703) 993-4511
Prerequisite: Permission of instructor. Students are expected to have familiarity with the basics of calculus, linear algebra, probability theory and statistics; understanding of basic programming principles and skills.
Text: Tom M. Mitchell, *Machine Learning,* McGraw-Hill, 1997
Exams: There is one midterm exam (points 0 - 100)
Final Exam : (points 0 - 100)
Final score: F = 0.3*(Midterm) + 0.4*(Homework / Projects) + 0.3*(Final Exam)

General description:

The course surveys algorithms that enable computers to learn a concept or automatically improve their performance of some task with experience. The main goal of this class is to familiarize students with basic concepts and algorithms of computational learning. Students who complete this course should be able to identify problems where computational learning algorithms can be useful and to apply these algorithms for finding the solution. We discuss the following topics: parametric/non-parametric learning, decision tree learning, neural networks, Bayesian learning, instance-based learning, bias/variance tradeoffs, Vapnik-Chernovenkis theory, support vector machines, and reinforcement learning. The class provides some necessary background introducing basic concepts from statistics, op-

timization, and information theory, relevant to computational learning. Some popular real world applications of computational learning algorithms are also discussed.

Academic Integrity:

Mason is an Honor Code university; please see the Office for Academic Integrity for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, you will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind) please ask for guidance and clarification.

Disability Services:

If you are a student with a disability and you need academic accommodations, please see me ad contact the Office of Disability Services (ODS) at 993-2474, http://ods.gmu.edu. All academic accommodations must be arranged through the ODS.

Counseling and Psychological Services (CAPS):

(703) 993 2380, http://caps.gmu.edu

University Policies:

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty and staff conduct in university academic affair. Other policies are available at http://universitypolicy.gmu.edu.