# Course Approval Form

**Action Requested:** (definitions available at website above)
- [X] Create NEW
- [ ] Inactivate
- [ ] Modify (check all that apply below)

**Course Level:**
- [X] Undergraduate
- [ ] Graduate

**Title (must be 75% similar to original):**

**Repeat Status:**
- [ ] Schedule Type
- [ ] Prereq/coreq
- [ ] Restrictions
- [ ] Grade Mode
- [ ] Other:

**Credits:**

**College/School:**
- COS

**Department:**
- Computational and Data Sciences

**Subject Code:**
- CDS

**Number:**
- 201

**Submitted by:**
- Andrew Crooks

**Ext:**
- 34640

**Email:**
- Acrooks2@gmu.edu

**Title:**
- Introduction to Computational Social Science

**Banner:**
- (30 characters max w/ spaces) Intro to Comp Social Sci

**Effective Term:**
- [X] Fall
- [ ] Spring
- [ ] Year
- [ ] Summer

**Fulfills Mason Core Req?** (undergrad only)
- [ ] Currently fulfills requirement
- [ ] Submission in progress

**Credits:**
- [X] Fixed  3
- [ ] Variable

**Repeat Status:**
- [X] Not Repeatable (NR)
- [ ] Repeatable within degree (RD)
- [ ] Repeatable within term (RT)
- [ ] Max credits allowed:

**Grade Mode:**
- [X] Regular (A, B, C, etc.)
- [ ] Satisfactory/No Credit
- [ ] Special (A, B C, etc. +IP)

**Schedule Type:**
- [X] Lecture (LEC)
- [ ] Lab (LAB)
- [ ] Recitation (RCT)
- [ ] Internship (INT)
- [ ] Independent Study (IND)
- [ ] Seminar (SEM)
- [ ] Studio (STU)

**Prerequisite(s):**
- None

**Corequisite(s):**
- None

**Restrictions Enforced by System:**
- Major, College, Degree, Program, etc. Include Code(s).

**Equivalencies**
- (check only as applicable):
  - [ ] YES, course is 100% equivalent to
  - [ ] YES, course renumbered to or replaces

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

**Description**
- Undergraduate-level introduction to computational concepts, principles, and modeling approaches in social sciences, emphasizing simulations and elements of complexity theory as they apply to social phenomena. Survey includes systems dynamics, cellular automata, and agent-based models.

**Notes**
- List additional information for the course

**Indicate number of contact hours:**
- Hours of Lecture or Seminar per week: 3
- Hours of Lab or Studio: 0

**When Offered:**
- [X] Fall
- [ ] Summer
- [ ] Spring

**Approval Signatures**

**For Graduate Courses Only**

**Graduate Council Member**

**Provost’s Office**

**Graduate Council Approval Date**

Form revised 9/14/2015
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 (required)
Course Number and Title: CDS 201: Introduction to Computational Social Science

Date of Departmental Approval: 10th November 2015

FOR NEW COURSES (required if creating a new course)

- **Reason for the New Course:**
  - Computational Social Science (CSS) is the interdisciplinary science of complex social systems and their quantitative investigation through computational modeling and related techniques (e.g. social network analysis). This course will showcase how CSS is at the intersection of social science and computer science and provide students the ability to investigate social phenomena through advanced computational modeling.
  
  - Students will be required to carry out short modeling exercises in this course thus turning what has been taught in the class into practice.
  
  - By the end of the course the student will not only understand what CSS offers the social and computational sciences but be able to design and implement a simple CSS project, that starts with a research question, data collection and why specific methods/models are used and concludes with some data/model analysis.

- **Relationship to Existing Programs:** Complements other CDS modeling and simulation courses.

- **Relationship to Existing Courses:** Non. This is a new course and GMU has nothing similar at the undergraduate level.

- **Semester of Initial Offering:** Fall 2016

- **Proposed Instructors:** TBD

- **Tentative Syllabus Below**
Prerequisites: None

Credits: 3

Instructor: TBD

Office Hours: TBD

Course Description: Undergraduate-level introduction to computational concepts, principles, and modeling approaches in social sciences, emphasizing simulations and elements of complexity theory as they apply to social phenomena. Survey includes systems dynamics, cellular automata, and agent-based models.

Lecture Content:

1. Introduction to Computational Social Science
   
2. Methods
   
 a. The role of modeling and simulation in the social sciences.
    
   i. How to build models for social systems

 b. Modeling techniques:
    
   i. System Dynamics
   ii. Discrete Event Simulations
   iii. Microsimulation
   iv. Cellular Automata
   v. Agent-based

 c. Applications:
    
   i. Traffic, economics, health, sustainability, etc.

Homework: Students will be expected to complete bi-weekly assignments and 1 project.

Exams: There will be one final exam and a midterm.

Evaluation: Homework (40%), Project (20%), Midterm (10%), Final Exam (30%)