

Computer Science Department
Special Topics Course Request Form

Instructions: Complete this form by supplying the information requested in the boxes below. E-mail or send the completed form and any supplemental information to the Computer Science Department, Moscow, ID 83844-1010 or to cs@cs.uidaho.edu. You may also fax the information to 208-885-9052. If approved, the request will be effective only for the semester for which it is submitted.

Contact Information			
Person initiating this request	Phone Number	E-mail Address	Date
Predrag T. Tasic	208-292-2516	ptosic@uidaho.edu	2/14/2018
Proposed instructor	Phone Number	E-mail Address	
Predrag T. Tasic	208-292-2516	ptosic@uidaho.edu	2/14/2018

Course Information						
Title	Special Topics in AI: Introduction to Intelligent Agents & Multi-Agent Systems					
Course No	<input type="checkbox"/> CS 404	<input type="checkbox"/> CS 504	<input checked="" type="checkbox"/> CS J404/504	Credits	3	Semester Offered
Locations Available	<input checked="" type="checkbox"/> Moscow	<input checked="" type="checkbox"/> IF	<input type="checkbox"/> Boise	Delivery Method	<input checked="" type="checkbox"/> Live	<input checked="" type="checkbox"/> Compressed Video
	<input checked="" type="checkbox"/> CdA	<input checked="" type="checkbox"/> Video Outreach			<input type="checkbox"/> Web	
Course Description	An agent-centric intro to AI; autonomous & intelligent agents; multi-agent systems and distributed AI; multi-agent communication; ontologies; multi-agent cooperation & collaboration; distributed problem solving; multi-agent coordination; intro to decision making under uncertainty and utility theory; intro to computational game theory & mechanism design; cooperative vs. competitive games; iterated games; computational social choice; cooperative multi-player games and coalition formation; brief intro to resource allocation and auction theory					
Course Type	<input checked="" type="checkbox"/> Lecture	<input type="checkbox"/> Lab	Prerequisites	1) UG Senior or Graduate standing; and 2) CS/MATH 395 (or equivalent); introductory Probability Theory; intro. Linear Algebra 3) or approval by Instructor NOTE: prior coursework on AI or Machine Learning would certainly be helpful, but isn't required		
Course Outline	<p>Course Overview and Introduction</p> <p><u>Course Outline</u></p> <p>This course is an introduction to two areas of growing popularity among both researchers and practitioners in contemporary AI, namely, Intelligent Agents and Multi-Agent Systems. The main emphasis will be given to the models of inter-agent interaction (such as cooperation, coordination, etc.) in medium- and large-scale multi-agent systems (MAS). The purpose of the course is to prepare students for AI research, especially in the areas of Distributed AI and MAS. The course pace will be fast, covering both the textbook material and research papers selected and assigned by the Instructor. Students' abilities to critically read, discuss and present cutting-edge research papers, as well as to write research reports, are necessary to succeed in and gain from this course.</p> <p><u>Topics to be covered:</u></p> <ul style="list-style-type: none"> • Intro to Intelligent Agents • Agents and Environments; An Agent-centric view of AI; embedded/situated Agents • Intro to Multi-Agent Systems and Paradigms, Issues & Challenges in Distributed AI • Ontologies; Ontology Design; Ontology Languages • Inter-Agent Communication; Agent Comm. Languages (selected examples) • Multi-Agent Cooperation; Distributed Problem Solving 					

	<ul style="list-style-type: none"> • Multi-Agent Coordination • Agent Methodologies; Agent-based Design/Programming (selected examples) • Brief Intro to Utility Theory and (classical) Game Theory • Strategic Multi-Agent Interactions; Cooperative, Competitive and “In-Between” Games • Brief Intro to Social Welfare and Social Choice; Voting • Cooperative Games; MAS Coalition Formation • (time-permitting) Resource Allocation; Simple Auctions; Combinatorial Auctions • (time-permitting) Brief Intro to Bargaining Theory <p><u>Additional Course Information</u></p> <p>The course is offered to both undergraduate students with senior standing and graduate students. The primary target audience: students from Computer Science, Electrical & Computer Engineering, and other programs in the College of Engineering. Students from other colleges/majors/programs, as well as those undergraduates who have not completed any coursework on AI or Machine Learning or related (“AI-centric”) subjects, and/or have not taken (combinatorial) algorithm design, should contact the Instructor for permission to enroll.</p>
Required Text	<p>Main text / required reading for the class:</p> <p>Textbook by M. Wooldridge, "An Introduction to MultiAgent Systems", 2nd edition Textbook info: http://www.cs.ox.ac.uk/people/michael.wooldridge/pubs/imas/IMAS2e.html</p> <p>Also, there will be research papers assigned to read, discuss and (at times) provide written reports on; this will be a mandatory, integral part of the course.</p>
Optional Resources	
Student Work	<p>You are required to attend lectures regularly; you can skip up to one full week worth of lectures without documenting the reasons for absence; beyond that, only documented emergencies will be accepted. You are also expected to actively engage in in-class discussions.</p> <p>Course-work will include considerable reading assignments, written assignments cf. based on conceptual (and some math. and/or algorithmic) problems, reading and presenting research papers, and either implementing a sizable hands-on programming project or writing a research paper on a theoretical aspect of Distributed AI.</p> <p>If a student’s attendance or performance becomes problematic, the instructor will report the student to the <i>Early Intervention System</i>. Cell-phones are not to be utilized during class (including making/receiving calls and text-messaging). Laptops are not allowed except when permitted by the instructor.</p> <p>Please read the Computer Science Conduct and Academic Integrity policy http://wiki.cs.uidaho.edu/index.php/CS_Department_Policies</p>
Grading	Homework: 20%, Project/Original Research Paper: 50%, Discussion/Presentation of Research Literature: 20% Attendance & Participation: 10%
Special HW or SW	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
TA or Grader	Yes <input checked="" type="checkbox"/> No (no TA needed for this course)
Comments	<p>This is a research-centric course. No TA/grader needed.</p> <p>Rationale: to prepare students to pursue cutting-edge research in AI, especially in any of a number of sub-areas of contemporary Distributed AI / Multi-Agent Systems. The broader purpose is to expand AI-related advanced training and research activity at UofI beyond Artificial Life, Machine Learning and Robotics. The particular purpose is for the Instructor to recruit talented (primarily graduate/PhD) students interested in AI, to work on their dissertation research under his supervision.</p>

Level of Approval	Date Approved	Date Denied	Signature
CS Curriculum Committee			
CS Department Faculty			

1. This form is to be used to propose any special topics course by the CS faculty on the Moscow campus or at any of the U of I resident instruction centers.
2. During the fall and spring semester the Chair of the CS Curriculum Committee will request proposals for the offering of special topics courses during the following semester. The announcement date will be set to allow preparation of proposals by interested faculty, processing of proposals by the CS Curriculum Committee, and voting by the CS faculty as a whole in time for approved courses to be included in the time schedule published by the Registrar. Under extenuating circumstances the committee and CS faculty will consider proposals that have not met the standard timeline for submission.
3. Completed course proposals will be provided to the CS Curriculum Committee for its review. The intent of the committee's review is to ensure that there is an adequate definition of the proposed special topics course and to ensure that the course meets the department's general academic standards for content and level of offering. The committee will also review a proposed course to ensure that it does not overly duplicate the content of another course. Courses receiving a favorable vote by the committee will be presented to the CS faculty as a whole and will come before the faculty as a seconded motion for their consideration. The review by the CS faculty as a whole is to ensure that the proposed course is consistent with the department's teaching and research objectives, that sufficient teaching and support resources can be made available, and that offering the proposed course does not adversely affect the department's ability to meet its other commitments.
4. The special topics course proposal must include the following information:

Contact and Instructor Information:

- (1) Name, phone number, and e-mail address of the person submitting the request.
- (2) Name, phone number, and e-mail address of the proposed course instructor. If the proposed instructor is not a regular or affiliate faculty member an Instructor Approval Form must be submitted to the department before the course may be offered.

Course Information:

- (1) Provide the course title.
- (2) Check the box indicating the course number designation that applies to the proposed course offering.
- (3) Indicate the number of credits to be applied.
- (4) Indicate the semester in which the course is to be offered.
- (5) Indicate the location(s) where the course will be available.
- (6) Indicate the delivery method(s) that will be used.
- (7) Provide a catalog-level course description.
- (8) Indicate the type of course, lecture, lab, or both, that is to be offered.
- (9) Indicate the course prerequisites by identifying specific courses that must have been completed prior to enrolling in the proposed course. If specific course prerequisites are not applicable, identify areas of expertise that students must have in order to be successful in the proposed course.
- (10) Provide an outline of the course in sufficient detail to enable the faculty to assess the course content.
- (11) Indicate the required text and/or other material, including software, you intended to use as the primary resource(s) for students.
- (12) Identify optional resources that individual students may wish to obtain.
- (13) Provide a general description of the work to be performed by the students (exams, projects, term paper, home work, presentations, programs, etc.).
- (14) Indicate your anticipated method of evaluating students for their final course grade, i.e., the percentage of grade based on individual elements of student work.
- (15) Identify special hardware and/or software, if any, the university must provide for student and / or instructor use. Identify the proposed source of funds.
- (16) Identify if TA or grader resources are required and if so, the proposed source of funds.
- (17) For graduate courses identify the emphasis area in which the course resides.
- (18) Include any additional comments or explanation that will assist the committee and faculty in evaluating this course proposal.