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| For Academic Affairs and Research Use Only |
| Proposal Number | SM23 |
| CIP Code:  |  |
| Degree Code: |  |

**New or Modified Course Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| **[X]New Course, [ ]Experimental Course (1-time offering), or [ ]Modified Course (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

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| Hong Zhou 8/3/2022**Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**COPE Chair (if applicable)** |
| Amanda Lambertus 8/12/2022**Department Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Head of Unit (if applicable)**   |
| John Hershberger 8/18/2022**College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Undergraduate Curriculum Council Chair** |
| Mary Elizabeth Spence 8/18/2022**Office of Assessment (new courses only)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Graduate Curriculum Committee Chair** |
| Lynn Boyd 8/23/2022**College Dean** | Alan Utter 9/12/2022**Vice Chancellor for Academic Affairs** |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**General Education Committee Chair (if applicable)**   |  |

1. **Contact Person (Name, Email Address, Phone Number)**

Amanda Lambertus, alambertus@astate.edu, 972-3090

1. **Proposed starting term and Bulletin year for new course or modification to take effect**

Fall 2023

**Instructions:**

*Please complete all sections unless otherwise noted. For course modifications, sections with a “Modification requested?” prompt need not be completed if the answer is “No.”*

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|  | **Current (Course Modifications Only)** | **Proposed (New or Modified)** *(Indicate “N/A” if no modification)* |
| **Prefix** |  | **MATH**  |
| **Number\*** |  | **2013** |
| **Title** (include a short title that’s 30 characters or fewer) |  | **Math for Computational Intelligence (Math for Comp Intel)** |
| **Description\*\*** |  | Mathematics in the context of human centered design, including sets, algorithms, logic, probability and statistics. Emphasis will be placed on exploring technologies that involve computational intelligence. SpringPrerequisites: MATH 1023.  |

 ***\**** Confirm with the Registrar’s Office that number chosen has not been used before and is available for use. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*.

\*\*Forty words or fewer (excepting prerequisites and other restrictions) as it should appear in the Bulletin.

1. **Proposed prerequisites and major restrictions** **[Modification requested? Yes/No]**

(Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. **YES** Are there any prerequisites?
	1. If yes, which ones?

Math 1023

* 1. Why or why not?

An understanding of Algebra is essential to understand and learn the mathematical concepts in this course.

1. **YES** Is this course restricted to a specific major?
	1. If yes, which major? Digital Technology and Design
2. **Proposed course frequency [Modification requested? Yes/No]**

(e.g. Fall, Spring, Summer; if irregularly offered, please indicate, “irregular.”) *Not applicable to Graduate courses.*

Spring

1. **Proposed course type [Modification requested? Yes/No]**

Will this course be lecture only, lab only, lecture and lab, activity (e.g., physical education), dissertation/thesis, capstone, independent study, internship/practicum, seminar, special topics, or studio? Please choose one.

Lecture – on-line only

1. **Proposed grade type [Modification requested? Yes/No]**

What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard Letter

1. **NO** Is this course dual-listed (undergraduate/graduate)?
2. **NO** Is this course cross-listed?

*(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross-listed course.)*

**a.** – If yes, please list the prefix and course number of the cross-listed course.

 Enter text...

 **b.** – **Yes / No** Can the cross-listed course be used to satisfy the prerequisite or degree requirements this course satisfies?

 Enter text...

1. **YES** Is this course in support of a new program?

a. If yes, what program?

 Digital Technology and Design

1. **NO** Will this course be a one-to-one equivalent to a deleted course or previous version of this course (please check with the Registrar if unsure)?

a. If yes, which course?

Enter text...

**Course Details**

1. **Proposed outline** **[Modification requested? Yes/No]**

(The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

Week 1-3: Foundations of Logic and Proofs, Boolean Algebra

Week 4-6: Basic Structures: Sets Functions, Sequences, Sums and Algorithms

Week 7: Matrices

Week 8: Number Theory and Cryptography

Week 9 -11: Introduction to Counting Principle and Probability

Week 12: Recursion and Advanced Counting Techniques

Week 13: Modeling Computation

Week 14: Presentations and Final Exam

Woven throughout all the content will be connections to human centered design in relation to computational intelligence. This will be done through the use of interactive websites and applications. Students will prepare, research and present projects connecting the mathematics to the human centered design.

1. **Proposed special features** **[Modification requested? Yes/No]**

(e.g. labs, exhibits, site visitations, etc.)

NA

1. **Department staffing and classroom/lab resources**

Enter text...

1. Will this require additional faculty, supplies, etc.?

We will need to find a faculty member (probably adjunct) to teach the class.

1. **NO** Does this course require course fees?

 *If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Justification**

**Modification Justification (Course Modifications Only)**

1. Justification for Modification(s)

NA

**New Course Justification (New Courses Only)**

1. Justification for course. Must include:

 a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

 Provide foundational mathematical concepts for computational intelligence and Human Centered problem solving. Students will gain knowledge of the foundational mathematics that provides the building stones for computational intelligence. They will then use this knowledge to evaluate websites, technologies and applications that use such intelligence. For a final project the students will do a concept design that involves computational intelligence, problem solving, and human centered design.

b. How does the course fit with the mission of the department? If course is mandated by an accrediting or certifying agency, include the directive.

 The course is a service course for the Department of Art & Design. The course is designed to help students in the new degree program, Digital Technology and Design, by providing students with foundational mathematics knowledge that is specifically linked to computational intelligence and Human Centered Design.

c. Student population served.

Students enrolled in the Digital Technology and Design Program.

d. Rationale for the level of the course (lower, upper, or graduate).

The course is an introductory course designed to help students gain an understanding of the mathematics involved in Artificial Intelligence. This is a service course in support of the new Digital Technology and Design Program.

**Assessment**

**Assessment Plan Modifications (Course Modifications Only)**

1. **NO** Do the proposed modifications result in a change to the assessment plan?

 *If yes, please complete the Assessment section of the proposal*

**Relationship with Current Program-Level Assessment Process (Course modifications skip this section unless the answer to #18 is “Yes”)**

1. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

The Digital Technology and Design Program will be assessed by the Department of Art and Graphic Design.

1. Considering the indicated program-level learning outcome/s (from question #19), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

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| **Program-Level Outcome 1 (from question #19)** | Type outcome here. What do you want students to think, know, or do when they have completed the course? |
| Assessment Measure | Please include direct and indirect assessment measure for outcome.  |
| Assessment Timetable | What semesters, and how often, is the outcome assessed? |
| Who is responsible for assessing and reporting on the results? | Who (person, position title, or internal committee) is responsible for assessing, evaluating, and analyzing results, and developing action plans? |

 *(Repeat if this new course will support additional program-level outcomes)*

 **Course-Level Outcomes**

1. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| **Outcome 1** | Students will be able to read, comprehend, and construct mathematical arguments. |
| Which learning activities are responsible for this outcome? | Homework, problem sets, discussion boards, and logic puzzles |
| Assessment Measure  | Tests, quizzes and final project |

*(Repeat if needed for additional outcomes)*

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| **Outcome 2** | Students will be able to represent discrete objects using the mathematical structures such as sets, permutation, relations, and graphs. |
| Which learning activities are responsible for this outcome? | Homework, problem sets, discussion boards |
| Assessment Measure  | Tests and final project  |

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| **Outcome 3** | Students will be able to describe an algorithm and evaluate algorithms within interactive websites and applications.  |
| Which learning activities are responsible for this outcome? | Discussion boards, written assignments, problem sets |
| Assessment Measure  | Rubrics for grading written assignments, exam |

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| **Outcome 4** | Students will be able to apply knowledge from mathematics to other disciplines within the fields of digital design |
| Which learning activities are responsible for this outcome? | Discussion boards and written assignments |
| Assessment Measure  | Presentations graded on a rubric. |

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| **Outcome 5** | Students will complete a concept development and design of a product, technology, application, or website that uses computational intelligence and human centered design. |
| Which learning activities are responsible for this outcome? | Presentation and written assignment |
| Assessment Measure  | Rubrics to grade the presentation and written assignment.  |

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  |

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|   | •  [MATH 1054 - Precalculus Mathematics](https://catalog.astate.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=3&expand=&navoid=78&search_database=Filter#/usr/local/webroot/acalog-legacy/shared/htdocs_gateway/ajax/preview_course.php) **Sem. Hrs:** **4** |
|    | [MATH 1093 - Making Connections Mathematics](https://catalog.astate.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=3&expand=&navoid=78&search_database=Filter)

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| Print (opens a new window)MATH 1093 - Making Connections Mathematics**Sem. Hrs:** **3**Required course for first semester freshmen. Core content includes transition to college, academic performance skills, problem solving, critical thinking, self management, group building skills, and university policies. Content related to the departmental majors is also included. Fall. |

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|    | MATH 2013 – Math for Computational IntelligenceMathematics in the context of human centered design, including sets, algorithms, logic, probability, and statistics. Emphasis will be placed on exploring technologies that involve computational intelligence. SpringPrerequisites: MATH 1023. [MATH 2113 - Mathematics for School Teachers I](https://catalog.astate.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=3&expand=&navoid=78&search_database=Filter)

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| Print (opens a new window)MATH 2113 - Mathematics for School Teachers I**Sem. Hrs:** **3**Sets, logic, and numbers with emphasis on the axiomatic development of the real numbers. Fall, Spring, Summer.**Prerequisites:** with a C or better in [MATH 1023](https://catalog.astate.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=3&expand=&navoid=78&search_database=Filter#tt8562) or [MATH 1043](https://catalog.astate.edu/content.php?filter%5B27%5D=MATH&filter%5B29%5D=&filter%5Bcourse_type%5D=-1&filter%5Bkeyword%5D=&filter%5B32%5D=1&filter%5Bcpage%5D=1&cur_cat_oid=3&expand=&navoid=78&search_database=Filter#tt3791). This course may not be used to satisfy general education mathematics requirement. |

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|    | •  [MATH 2123 - Mathematics for School Teachers II](https://catalog.astate.edu/preview_course_nopop.php?catoid=3&coid=4839) **Sem. Hrs:** **3** |