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| For Academic Affairs and Research Use Only | |
| Proposal Number | SM24 |
| CIP Code: |  |
| Degree Code: |  |

**New or Modified Course Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

|  |
| --- |
| **[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.

|  |  |
| --- | --- |
| Hong Zhou 2/23/2021 **Department Curriculum Committee Chair** | Alicia Shaw 10/8/2021  **COPE Chair (if applicable)** |
| Amanda Lambertus 3/29/2021 **Department Chair** | Lance G. Bryant 10/8/2021  **Head of Unit (if applicable)** |
| |  |  | | --- | --- | | Mary Elizabeth Spence | 10/8/2021 | | **Office of Assessment** |  | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| John Hershberger 10/1/2021 Enter date… **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| Lynn Boyd 10/4/2021 **College Dean** | Alan Utter 11/16/2021  **Vice Chancellor for Academic Affairs** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (if applicable)** |  |

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

Lisa Rice, [lrice@astate.edu](mailto:lrice@astate.edu), 870-680-8124

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

Fall 2022

**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.”*

|  |  |  |
| --- | --- | --- |
|  | **Current (Course Modifications Only)** | **Proposed (New or Modified)**  *(Indicate “N/A” if no modification)* |
| **Prefix** |  | **MATH** |
| **Number\*** |  | **3373** |
| **Title** |  | **Full Title: Mathematics for Secondary Teachers**  **Short Title: Math for Secondary Teachers** |
| **Description\*\*** |  | **Mathematics at the secondary level from an advanced perspective. Functions including polynomial and transcendental; geometry and measurement; probability and statistics; number systems. Course may not be used to satisfy a general education mathematics requirement. Must be admitted to the Teacher Education Program. For secondary mathematics education majors only.** |

***\**** (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 as it should appear in the Bulletin.

1. **Proposed prerequisites and major restrictions** **[Modification requested? 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? Yes
   1. If yes, which ones?

MATH 2214 with a C or better AND admission to the Teacher Education Program. Department approval required.

* 1. Why or why not?

MATH 2214 is Calculus II. The content covered in the course will explore topics foundational for Calculus II, such as derivatives and integrals.

1. Yes Is this course restricted to a specific major?
   1. If yes, which major? BSE Mathematics
2. **Proposed course frequency [Modification requested? No]**

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

Course to be offered each fall semester of every academic year.

1. **Proposed course type [Modification requested? 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.

The course will be lecture only.

1. **Proposed grade type [Modification requested? 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. **No** Is this course in support of a new program?

a. If yes, what program?

Enter text...

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? 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: Number Systems

Week 2: Operations in Number Systems

Week 3: Functions and Lines in the Plane

Week 4: Functions, including exponential, logarithmic, and those defined for complex numbers

Week 5: Quadratic Polynomials

Week 6: Higher Degree Polynomials

Week 7: Trigonometry

Week 8: Trigonometry and Hyperbolic Trigonometry

Week 9: Measurement

Week 10: Measurement

Week 11: Geometry

Week 12: Geometry

Week 13: Probability

Week 14: Probability

Week 15: Statistics

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

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

Computer Lab: Geogebra software (free, web-based), Geometer’s Sketchpad, Desmos

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

Resources are currently available in lab.

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

No

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)

Enter text...

**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)

Currently, in the BSE program there are no courses related to deepening the mathematical knowledge of students who are preparing to be 7-12 mathematics teachers specific to the mathematics they are expected to teach. This course will give students a deeper perspective of the mathematics they will teach at the 7-12 level by exploring the underlying mathematical concepts, connections, and procedures. This course will give students a foundation to build mathematics lessons and assessments in other courses, such as SCED 3515 Performance Based Instructional Design and EDMA 4563 Methods and Materials for Teaching Mathematics. This course will also help students prepare for the Praxis II Mathematics Content exam, which they need to pass to obtain a teaching license.

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.

This course enhances the mission of the department to “provide students with the opportunity and the direction to pursue the intellectual challenges of mathematics; and to provide the mathematical and pedagogical knowledge necessary for teaching mathematics in grades 7-12.” The content of this course will require students to explore the underlying ideas of the mathematics they will teach by unpacking mathematical concepts and exploring how and why mathematical procedures work. The mathematical topics directly relate to the content they are expected to teach at the 7-12 level, but from an advanced perspective, and connections to classroom practice will be emphasized.

c. Student population served.

Juniors and seniors (upper)

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

In general, BSE Mathematics majors have at least one field experience in their first two years at university, which gives them an opportunity to observe mathematics taught in schools. These field experiences can provide background for the connections made to teaching in the course. Also, during the first two years at university, students spend much of their time satisfying general education requirements. As they transition to juniors they take more courses in their major field. The advanced mathematics courses students take as juniors and seniors expose them to mathematics at a more abstract level. The course proposed here can be a bridge from the abstract mathematics to the content they are expected to teach.

**Assessment**

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

1. **Yes / 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 #19 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?

Program-Level Outcome 1: Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications within and among mathematical domains of Number; Algebra and Functions; Calculus; Statistics and Probability; Geometry, Trigonometry, and Measurement.

Program-Level Outcome 2: Candidates demonstrate, within or across mathematical domains, their knowledge of and ability to apply the mathematical processes of problem solving; reason and communicate mathematically; and engage in mathematical modeling. Candidates apply technology appropriately within these mathematical processes.

1. Considering the indicated program-level learning outcome/s (from question #20), 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.*

|  |  |
| --- | --- |
| **Program-Level Outcome 1 (from question #20)** | Candidates demonstrate and apply understandings of major mathematics concepts, procedures, knowledge, and applications within and among mathematical domains of Number; Algebra and Functions; Calculus; Statistics and Probability; Geometry, Trigonometry, and Measurement. |
| Assessment Measure | Direct Assessments: Graded assignments (e.g., homework and projects) and exams. Indirect Assessments: Student written reflections/surveys, final course grades. |
| Assessment  Timetable | Every fall semester (course is fall only). |
| Who is responsible for assessing and reporting on the results? | Dr. Lisa Rice will hold primary responsibility for assessing, evaluating, and analyzing results, and developing action plans. Dr. Lambertus, BSE Mathematics Program Chair, will support Dr. Rice in the assessment process, particularly in the analysis and development of action plans. |
| **Program-Level Outcome 2 (from question #20)** | Candidates demonstrate, within or across mathematical domains, their knowledge of and ability to apply the mathematical processes of problem solving; reason and communicate mathematically; and engage in mathematical modeling. Candidates apply technology appropriately within these mathematical processes. |
| Assessment Measure | Direct Assessments: Graded assignments (e.g., homework and projects) and exams. Indirect Assessments: Student written reflections/surveys, final course grades. |
| Assessment  Timetable | Every fall semester (course is fall only). |
| Who is responsible for assessing and reporting on the results? | Dr. Lisa Rice will hold primary responsibility for assessing, evaluating, and analyzing results, and developing action plans. Dr. Lambertus, BSE Mathematics Program Chair, will support Dr. Rice in the assessment process, particularly in the analysis and development of 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** | Demonstrate understanding of the development and use of algorithms and procedures, and apply algorithms and procedures to solve problems. |
| Which learning activities are responsible for this outcome? | In-class activities and presentations, assigned readings. |
| Assessment Measure | What will be your assessment measure for this outcome? |

*(Repeat if needed for additional outcomes)*

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| **Outcome 2** | Make connections across mathematical domains to formulate and solve problems, including applying a variety of strategies to solve problems. |
| Which learning activities are responsible for this outcome? | Weekly problem sets, in-class group problem solving activities, lab assignments. |
| Assessment Measure | What will be your assessment measure for this outcome? |

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| **Outcome 3** | Connect mathematics taught at the high school level to advanced mathematics seen the BSE Mathematics content courses. |
| Which learning activities are responsible for this outcome? | Assigned reading discussions and reflections. Assignments connecting high school math teaching standards to advanced college-level mathematical topics. |
| Assessment Measure | What will be your assessment measure for this outcome? |

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| **Outcome 4** | Communicate mathematics effectively in written and oral forms. |
| Which learning activities are responsible for this outcome? | Practice teaching mini-lessons to the class based on lesson plans they have developed. |
| Assessment Measure | What will be your assessment measure for this outcome? |

**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.** |

**Major in Mathematics**

**Bachelor of Science in Education**

A complete 8-semester degree plan is available at https://www.astate.edu/info/academics/degrees/

|  |  |
| --- | --- |
| **University Requirements:** | |
| See University General Requirements for Baccalaureate degrees (p. 42) | |
| **First Year Making Connections Course:** | **Sem. Hrs.** |
| MATH 1093, Making Connections - Mathematics | **3** |
| **General Education Requirements:** | **Sem. Hrs.** |
| See General Education Curriculum for Baccalaureate degrees (p. 78)  **Students with this major must take the following:**  *MATH 2204, Calculus I*  *PHYS 2034, University Physics I* ***OR***  *PHYS 2054, General Physics I*  *HIST 2763, The United States To 1876* ***OR***  *HIST 2773, The United States Since 1876*  *POSC 2103, Introduction to United States Government*  *PSY 2013, Introduction to Psychology*  **Select one of the following courses: (required Dept Gen Ed Option)**  ANTH 2233, Introduction to Cultural Anthropology  GEOG 2613, Introduction to Geography  HIST 1013, World History to 1500  HIST 1023, World History since 1500  *~~COMS 1203, Oral Communication (Required Departmental Gen. Ed. Option)~~* | **36** |
| **Major Requirements:** | **Sem. Hrs.** |
| MATH 2183, Discrete Structures | 3 |
| MATH 2214, Calculus II | 4 |
| MATH 3254, Calculus III | 4 |
| MATH 3243, Linear Algebra | 3 |
| MATH 3303, Modern Algebra I | 3 |
| MATH 3323, Mathematics Modeling | 3 |
| MATH 3343, College Geometry | 3 |
| MATH 3353, History of Mathematics | 3 |
| *MATH 3373, Mathematics for Secondary Teachers*  MATH 4553, Advanced Calculus I | *3*  3 |
| STAT 3233, Applied Statistics I | 3 |
| STAT 4453, Probability and Statistics I | 3 |
| **Sub-total** | **38** |
| **Additional Requirements:** | **Sem. Hrs.** |
| **~~Select one of the following courses:~~**  ~~ANTH 2233, Introduction to Cultural Anthropology~~  ~~GEOG 2613, Introduction to Geography~~  ~~HIST 1013, World History to 1500~~  ~~HIST 1023, World History since 1500~~ | ~~3~~ |
| PHYS 2044, University Physics II **OR**  PHYS 2064, General Physics II | 4 |
| Computer Science Elective | 3 |
| **Sub-total** | **7** |
| **Professional Education Requirements:**  Grade of “C” or better required for all Professional Education Requirements.  Courses denoted below with an asterisk (\*) require admission to the Teacher Education Program. For additional information, see Professional Education Requirements for Sec­ondary Majors in the College of Education and Behavioral Science section. | **Sem. Hrs.** |
| \*EDMA 4563, Methods and Materials for Teaching Mathematics in the Secondary School | 3 |
| ELSE 3643, The Exceptional Student in the Regular Classroom | 3 |
| PSY 3703, Educational Psychology | 3 |

Major in Mathematics (cont.)

**Bachelor of Science in Education**

A complete 8-semester degree plan is available at <https://www.astate.edu/info/academics/degrees/>

|  |  |
| --- | --- |
| SCED 2513, Introduction to Secondary Teaching | 3 |
| \*SCED 3515, Performance Based Inst. Design | 5 |
| \*SCED 4713, Educational Measurement with Computer Applications | 3 |
| \*TIMA 4826, Teaching Internship in the Secondary School | 12 |
| **Sub-total** | **32** |
| **Additional General Requirements for Teacher Education:** | **Sem. Hrs.** |
| HLTH 2513, Principles of Personal Health | **3** |
| **Electives:** | **Sem. Hrs.** |
| Electives | **1** |
| **Total Required Hours:** | **120** |

Page 541 2021-2022 Undergraduate Bulletin

Mathematics (MATH)

**MATH 3273. Applied Complex Analysis.**  Survey of complex analysis with emphasis on developing skills needed for applications and understanding of derivatives and integrals of complex

functions. Prerequisite, MATH 3254. Fall, even.

**MATH 3303. Modern Algebra I.**  Introduction to the theory of groups and rings, with emphasis

on modular arithmetic proofs. Prerequisite, MATH 2214. Fall.

**MATH 3323. Mathematical Modeling.**  Construction of mathematical models for use with problems in the mathematical sciences, operations research, engineering and the management and

life sciences. Prerequisite, MATH 2214. Spring.

**MATH 3343. College Geometry.**  Origin and development of Euclidean and Transformational

Geometry, explorations of spherical and hyperbolic geometries. Implementation of geometric

software. Prerequisite, MATH 2214. Spring.

**MATH 3353. History of Mathematics.** Origin and development of modern mathematical concepts. Topics include systems of numeration, algebra, geometry, calculus, and the foundations of

the real number system. Prerequisite, MATH 2214. Fall, odd.

***MATH 3373. Mathematics for Secondary Teachers. Mathematics at the secondary level from an advanced perspective. Functions including polynomial and transcendental; geometry and measurement; probability and statistics; number systems. Course may not be used to satisfy a general education mathematics requirement. Must be admitted to the Teacher Education Program. For secondary mathematics education majors only. Prerequisite, MATH 2214. Fall.***

**MATH 4403.  Differential Equations.**   Topics in the elementary theory of differential equations,

including existence theorems and applications. Prerequisite, MATH 3254. Fall, Spring.

**MATH 4413. Partial Differential Equations.** A study of the method of separation of variables to solve

some standard partial differential equations; Fourier series; boundary value problems; Sturm-Liouville

theory; and the method of characteristics. Prerequisite, MATH 4403. Dual listed with MATH 5413.

Spring, odd.