## Curriculum Proposal

**MATH 20-21 #23**

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| 1.12 Signatures |
BSU Curriculum Forms

Form 1

Curriculum Modification Summary

College: Business, Mathematics and Science
Department: Mathematics and Computer Science
Proposer: Dr. Heidi Hansen
Proposer’s position: Professor, Mathematics

Describe the modification(s) you propose, and how it (/they) will work to students’ advantage. (This description and explanation will be included in Curriculum Report packets forwarded to the Faculty Senate.):

1) Minnstate has been engaged in revising the requirements for developmental education across the system. The Minnstate Developmental Education Strategic Roadmap (DESR) Mathematics Workgroup recently revised the shared learner outcomes (SLOs) for developmental mathematics courses, in order to ensure that students can be prepared for liberal education requirements at the colleges and universities. This curriculum proposal seeks to change our current student learning outcomes for Math 0800 to align with the SLOs developed by the workgroup. This change is required by Minnstate.

2) Math 1120 Environmental Math did not previously list which grade in Math 0800 was required in order to use 0800 as a prerequisite for Math 1120, so a change form for Math 1120 stating the requirement of a B or better in Math 0800 has been submitted. This will clarify for students the need to have this grade if they plan on taking Environmental Math as their liberal education class in the event they needed to take developmental math course Math 0800 first.

Modifications proposed (specify number of each):
___2_Course Modification(s) (form 2) (2 forms)
_____New Course(s) (form 3)
_____Course Drop(s) (form 4)
_____Program Modification(s) (form 5)
_____New Program(s) (form 6)
_____Program Drop(s) (form 7)

The modifications affect (check):
___X_Liberal Education
___X_Undergraduate Curriculum
_____Graduate Curriculum
_____Teacher Licensure Program(s)
BSU Curriculum Forms
Form 2
Updated 9.19.15

Course Modification Form

Current Course Number(s):
   Undergraduate: MATH 0800
   Graduate:
Proposed Course Number(s), if different:
   Undergraduate: No change
   Graduate:

Current Course Title: Intermediate Algebra
Proposed Course Title, if different: No change

Current Course Description: An algebra course designed for students with an insufficient algebraic background for CS 1309, MATH 1100, MATH 1107, or MATH 1170. This course must be taken for a letter grade and, to use this course as a prerequisite for MATH 1100 or MATH 1107, a grade of C or better must be achieved, and to use this course as a prerequisite for CS 1309 or MATH 1170, a grade of B or better must be achieved. Credits are not applicable towards graduation. Topics include solving linear and quadratic equations, applications, linear inequalities, factoring, operations on polynomials, rational and radical expressions, and graphing linear equations.

Proposed Course Description, if different: An algebra course designed for students with an insufficient algebraic background for CS 1309, MATH 1100, MATH 1107, or MATH 1170. This course must be taken for a letter grade and, to use this course as a prerequisite for MATH 1100 or MATH 1107, a grade of C or better must be achieved, and to use this course as a prerequisite for CS 1309, MATH 1120 or MATH 1170, a grade of B or better must be achieved. Credits are not applicable towards graduation. Topics include solving linear and quadratic equations, applications, linear inequalities, factoring, operations on polynomials, rational and radical expressions, and graphing linear equations.

Current Credits: 3
Proposed Credits, if different: No change

Current Prerequisite(s):
   Undergraduate: None
   Graduate:
Proposed Prerequisite(s), if different:
   Undergraduate: No change
   Graduate:
1) Reason(s) for change(s):
MinnState has been engaged in modifying the requirements for developmental education across the system. The MinnState Developmental Education Strategic Roadmap (DESR) Mathematics Workgroup recently revised the shared learner outcomes (SLOs) for developmental mathematics courses, in order to ensure that developmental education students can be prepared to take liberal education requirements at the colleges and universities within a year (or less). This curriculum proposal seeks to change our current student learning outcomes for Math 0800 to align with the SLOs developed by the workgroup. This change is required by MinnState.

2) May this modified course replace the current course for students remaining in the old curriculum? Yes ___X__ No _____ If not, please drop the current course and submit a new course form for the modification.

3) Do these modifications change any of the following? **For all Yes answers, please provide updated information on the next page.**

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Student Learning Outcomes</td>
<td><em><strong>X</strong></em></td>
<td>No _____</td>
</tr>
<tr>
<td>Major Content Areas</td>
<td>Yes</td>
<td>No _____</td>
</tr>
<tr>
<td>Projected Maximum Class Size (Cap)</td>
<td>Yes</td>
<td>No _____</td>
</tr>
</tbody>
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4) Current Course fee(s) per student: $ **NONE**
for:
Proposed Course fee(s) per student, if different: $ 
for:

5) Service Areas: **NONE**
This course is a requirement or an elective in the programs/areas listed below. To locate where this course appears please search the online catalog, as follows:
   a) go to [http://www.bemidjistate.edu/academics/catalog/](http://www.bemidjistate.edu/academics/catalog/) and choose the most recent catalog(s),
   b) click on “Areas of Study, and Course Descriptions,“
   c) click on “PDF of Entire Catalog” in upper right,
   d) press Ctrl F, and enter the prefix and number of the course(s) from this form.

   Non-licensure programs:

   Teacher Licensure programs:

   Liberal Education:

The above “service area” programs/departments were notified of this modification on _______ (date) by __________________ (mail, email, or phone).

Please check one of the items below:
No comments were received from other programs or departments within one week of the notification.

Comments were received within one week of the notification, and are attached.
Current common course outline from catalog with changes to SLOs and addition of grade requirement for Math 1120.

Bemidji State University
MATH 0800: Intermediate Algebra
A. COURSE DESCRIPTION
Credits: 3
Lecture Hours/Week: *.*
Lab Hours/Week: *.*
OJT Hours/Week: *.*
Prerequisites: None
Corequisites: None
MnTC Goals: None

An algebra course designed for students with an insufficient algebraic background for CS 1309, MATH 1100, MATH 1107, or MATH 1170. This course must be taken for a letter grade and, to use this course as a prerequisite for MATH 1100 or MATH 1107, a grade of C or better must be achieved, and to use this course as a prerequisite for CS 1309, MATH 1120 or MATH 1170, a grade of B or better must be achieved. Credits are not applicable towards graduation. Topics include solving linear and quadratic equations, applications, linear inequalities, factoring, operations on polynomials, rational and radical expressions, and graphing linear equations.

B. COURSE EFFECTIVE DATES: 08/21/1997 – Present
C. OUTLINE OF MAJOR CONTENT AREAS
1. Linear and quadratic equations
2. Applications
3. Linear inequalities
4. Factoring
5. Operations on polynomials
6. Rational and radical expressions
7. Graphing linear equations

D. LEARNING OUTCOMES (General)
1. Demonstrate facility with the basic operations of integers, including addition, subtraction, multiplication, division and exponentiation, and use order of operation correctly.
2. Demonstrate facility with the basic operations of fractions including addition, subtraction, multiplication and division.
3. Demonstrate ability to write and solve single and multiple step equations and inequalities in a single variable.
4. Demonstrate ability to add, subtract, multiply and divide polynomial expressions.
5. Demonstrate ability to factor monomials from polynomials, and factor trinomials.
6. Exhibit ability to add, subtract, multiply and divide rational expressions and solve proportions.
7. Show they are able to write and graph linear equations in two variables.
8. Demonstrate ability to simplify, add, subtract and multiply and divide radical expressions.

1. Perform operations on polynomial, rational, and radical expressions.
2. Factor polynomials using a variety of methods.
3. Translate between graphical, tabular, verbal, and symbolic representations of functions and relations.
4. Analyze graphs of a variety of functions.
5. Solve a variety of equations and linear inequalities.
6. Solve systems of equations using algebraic and graphical methods.
7. Use numerical, symbolic, and graphical methods to model, solve, and interpret the results of application problems.
8. Determine if a relation is a function and use function notation appropriately.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
None

F. LEARNER OUTCOMES ASSESSMENT
As noted on course syllabus

G. SPECIAL INFORMATION
None noted
<table>
<thead>
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<th>Course Outcomes</th>
<th>Course Outcomes for Designated Course</th>
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<tr>
<td></td>
<td><strong>Institution</strong>: Bemidji State University</td>
</tr>
<tr>
<td></td>
<td><strong>Course Name and Number</strong>: Math 0800</td>
</tr>
</tbody>
</table>

1. Perform operations on polynomial, rational, and radical expressions.

   - Basic Skills Review
     - Apply the order of operations to real number expressions including addition, subtraction, multiplication, division, grouping symbols, absolute value, rational exponents, and roots.
     - Perform operations on polynomial expressions.
     - Use rules of exponents to simplify expressions.
     - Perform operations on radical expressions.
     - Convert expressions between radical form and exponential form.
     - Simplify and perform operations on rational expressions.

2. Factor polynomials using a variety of methods.

   - Factor trinomials
   - Factor quadrinomials by grouping

3. Translate between graphical, tabular, verbal, and symbolic representations of functions and relations.

   - Translate among graphical, tabular, verbal, and symbolic representations, including applications, for:
     - linear
     - quadratic
     - exponential
     - logarithmic

4. Analyze graphs of a variety of functions

   - Identify the domain and range of functions and relations including applications, for:
     - linear
     - quadratic
     - exponential
     - logarithmic
   - Identify key graph features (e.g. extreme
<p>| | |</p>
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| 5. **Solve a variety of equations and linear inequalities.** | • Solve literal equations  
• Solve rational, radical, and quadratic equations analytically  
• Solve absolute value equations and inequalities  
• Solve a variety of math problems using multiple representations including tables, graphs, words, and symbols  
• Interpret slope and intercepts  
• Interpret solutions |
| 6. **Solve systems of equations using algebraic and graphical methods.** | • Solve 2x2 systems of linear equations using:  
  o Substitution  
  o Graphically |
| 7. **Use numerical, symbolic, and graphical methods to model, solve, and interpret the results of application problems.** | • Interpret solutions of problems in context and determine if quantitative results are reasonable  
• Write algebraic expressions, equations to represent contextualized applications (i.e., simple interest)  
• Solve applied mathematics problems involving linear, quadratic, rational, and radical models. |
| 8. **Determine if a relation is a function and use function notation appropriately.** | • Evaluate functions for specified domain values  
• Use and interpret function notation  
• Identify independent and dependent variables |
BSU Curriculum Forms

Form 2
Updated 9.19.15

Course Modification Form

Current Course Number(s):
   Undergraduate: MATH 1120
   Graduate:
Proposed Course Number(s), if different:
   Undergraduate: No change
   Graduate:

Current Course Title: Environmental Mathematics
Proposed Course Title, if different: No change

Current Course Description: This course will explore topics in which mathematics is used to investigate and inform decisions about environmental issues. Environmental issues addressed may include a study of population change, geoscience topics as related to economics and water resources, the average temperature of the earth, and data about the environment. Mathematical concepts may include iterative functions, unit conversion and statistics. Liberal Education Goal Areas 4 & 10.

Proposed Course Description, if different: No change

Current Credits: 3
Proposed Credits, if different: No change

Current Prerequisite(s):
   Undergraduate: None
   Graduate:
Proposed Prerequisite(s), if different:
   Undergraduate: Successful completion of MATH 0800 with a grade of B or better, or three years of high school mathematics (including two years of algebra) and an appropriate score on the Mathematics Placement Test.
   Graduate:

1) Reason(s) for change(s):
The Environmental Math course did not have prerequisites listed, but since the department was making changes to the Math 0800 course, it is appropriate to make this addition at the same time so the catalog entries are in agreement.

2) May this modified course replace the current course for students remaining in the old curriculum? Yes ___X__ No _____ If not, please drop the current course and submit a new course form for the modification.
3) Do these modifications change any of the following? **For all Yes answers, please provide updated information on the next page.**

- Student Learning Outcomes: Yes _____ No __X___
- Major Content Areas: Yes _____ No __X___
- Projected Maximum Class Size (Cap): Yes _____ No __X___

4) Current Course fee(s) per student: $ **NONE**
   for:
   Proposed Course fee(s) per student, if different: $
   for:

5) Service Areas:
   This course is a requirement or an elective in the programs/areas listed below. To locate where this course appears please search the online catalog, as follows:
   a) go to http://www.bemidjistate.edu/academics/catalog/ and choose the most recent catalog(s),
   b) click on “Areas of Study, and Course Descriptions,”
   c) click on “PDF of Entire Catalog” in upper right,
   d) press Ctrl F, and enter the prefix and number of the course(s) from this form.

   Non-licensure programs:
   **Indigenous Sustainability Studies, B.S. major (part of elective list)**

   Teacher Licensure programs:
   **Liberal Education:**

   The above “service area” programs/departments were notified of this modification on _01.25.2021________ (date) by __email______________ (mail, email, or phone).

   Please check one of the items below:

   ________ No comments were received from other programs or departments within one week of the notification.

   __X______ Comments were received within one week of the notification, and are attached.

---

**From:** Lopez-Aguilera, Ana M <ana.lopezaguilera@bemidjistate.edu>
**Sent:** Monday, January 25, 2021 5:10 PM
**To:** Isaacson, Carl W <Carl.Isaacson@bemidjistate.edu>; Hansen, Heidi B <Heidi.Hansen@bemidjistate.edu>
**Cc:** Gullickson, Robin S <Robin.Gullickson@bemidjistate.edu>
**Subject:** Re: Curriculum change--Math 1120

Hi Heidi,
Same here. Looks good to me. I will pass it to the department.

Regards,
Ana

Ana M. López-Aguilera, Ph.D.
Assistant Professor of Spanish, and Chair
Languages and Indigenous Studies
Bemidji State University
ana.lopezaguilera@bemidjistate.edu

From: Isaacson, Carl W <Carl.Isaacson@bemidjistate.edu>
Sent: Monday, January 25, 2021 1:36 PM
To: Hansen, Heidi B <Heidi.Hansen@bemidjistate.edu>; Lopez-Aguilera, Ana M <ana.lopezaguilera@bemidjistate.edu>
Cc: Gullickson, Robin S <Robin.Gullickson@bemidjistate.edu>
Subject: RE: Curriculum change--Math 1120

Heidi,

This looks fine to me. I will pass this along to my colleagues for their feedback and I don’t expect any resistance.

All the best,
Carl

From: Hansen, Heidi B <Heidi.Hansen@bemidjistate.edu>
Sent: Monday, January 25, 2021 12:00 PM
To: Isaacson, Carl W <Carl.Isaacson@bemidjistate.edu>; Lopez-Aguilera, Ana M <ana.lopezaguilera@bemidjistate.edu>
Cc: Gullickson, Robin S <Robin.Gullickson@bemidjistate.edu>
Subject: Curriculum change--Math 1120

Hello Carl and Ana-

The Math department has been required by MinnState to update our SLOs for developmental Math 0800. In that process, we decided to change the prerequisite requirement for Math 1120 to requiring a B or better in Math 0800. This was not included in the description of Math 1120 in the past. See attached Curriculum proposal. Since this is an elective for Indigenous Sustainability, I am asking for your comments on this change.

I’m cc‘ing Robin here, too.

Thanks

Heidi

Dr. Heidi B. Hansen
Professor, Math/CS
Bemidji State University
hhansen@bemidjistate.edu
BSU Curriculum Forms
Form 8
Updated: 09.18.15

Signatures

__Heidi Hansen / Professor / 12.14.2020______________________________
Proposer / Title / Date

__Marty J Wolf / Mathematics and Computer Science / 01.22.2021___________
Chair or Director / Department or Program / Date

Note: "All departmental recommendations [on curriculum] must be reviewed and approved by the department's faculty." --IFO/MnSCU Master Agreement 2009-2011, 20.A.3 (p. 80).

At this point, packet goes to Records Office/Curriculum Coordinator to be logged in to the Curriculum Proposal Progress Grid.

__Marilyn Yoder / Business, Mathematics and Sciences / 01.27.2021__________
Dean / College / Date

Note: If proposal is sent back to the Proposer, please notify the Curriculum Coordinator. If approved, packet goes to Academic Affairs Office.