

MTLM 5020: Integrated Mathematics II
Summer 2018

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Office Hours:
6/4 – 6/21 By Appointment MTWR
6/25 – 6/28 MTR 12:30pm – 2:00pm

Prerequisites: Successful completion of MTH 1610, or successful completion of the MTH 1610 Place-Out Test administered by the Department of Mathematical and Computer Sciences, or successful completion of a course accepted for transfer as MTH 1610 by the Department of Mathematical and Computer Sciences or the College.

Requirements: A clear plastic ruler, graph paper, and a scientific calculator; that is, a calculator that can handle numbers in scientific notation and has [y^x], [π], and [$!$] keys.

Required Text:

Boaler, J., & Dweck, C. S. (2016). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*.

Optional Texts:

Hiebert, J. (1997). *Making Sense: Teaching and Learning Mathematics with Understanding*. Portsmouth, NH: Heinemann.

Van de Walle, J. A. *Elementary and Middle School Mathematics: Teaching Developmentally (Most Recent Edition)*. White Plains, NY: Longman. [This is an excellent mathematics teaching methods text.]

Course Overview: This course is designed to help prospective teachers develop a sound background in the concepts underlying the school mathematics curriculum. Teachers working in the diverse contexts of school mathematics classrooms must possess not only sound understanding of mathematical ideas, but of the processes by which this understanding develops and in which this understanding is applied. Therefore, how one does mathematics in this class is as important as the mathematical ideas themselves. In this course, students will:

- Pose and solve problems, individually, and in groups, in class and outside of class;
- Examine patterns and structure; formulate generalizations and conjectures; investigate and test their conjectures using concrete materials and other tools; and construct, evaluate, and explain their mathematical arguments;
- Describe and analyze their work and the work of others, both orally and in writing;
- Use a variety of tools, including manipulative models and technology, to solve problems.
- Demonstrate working knowledge of the big mathematical ideas of the course.

Proficiency in Mathematics for Teaching: In general, mathematical proficiency includes the following dimensions:

- Conceptual understanding of the big ideas that underlie the school mathematics curriculum and fluency with the procedures, skills and tools used to do mathematics.
- The strategic competence needed to tackle novel mathematical problems, and the adaptive reasoning needed to explain and justify methods and solutions;
- A productive disposition toward doing and learning mathematics. A prospective teacher has a productive disposition if she views mathematics as a sensible and meaningful discipline, and if she sees herself as capable of making sense of mathematics through persistent and diligent effort.

The Mathematical “Big Ideas” of This Course

- [1] Mathematical problem-solving, reasoning, and communication;
- [2] Rational Numbers;
- [3] Ratios and Proportional Reasoning;
- [4] Statistics;
- [5] Patterns and their identification, representation, analysis, generalization and use.

The Nature of Mathematics “Big Ideas” of This Course

- [A] Mathematical practices (as described in the Standards for Mathematical Practice in the Colorado Academic Standards for mathematics)
- [B] Mathematical disposition (That is, participating in the individual, small-group, and whole-class activities and discussions that constitute the daily work of the course; offering mathematical ideas for discussion and analysis by others, both orally and in writing; demonstrating intellectual commitment to learning and teaching mathematics.)

Evaluation:

Your course grade will be based on the following assessments:

- **Analyses of Mathematical Thinking (AMTs):** An important part of learning to teach well is learning how to study teaching and the way students think. These skills are important for you to develop as you move through the program, and these are the same skills that instructors of this course use to make this the best course possible. You will have an opportunity to develop these skills by analyzing and summarizing case-based examples of children’s mathematical thinking. These written summaries, composed outside of class, will be scored using the AMT scoring guide below. There will be at least 3 AMTs.
- **Exams:** There will be two midterm exams and one cumulative final exam to measure your understanding of the course material. All exams will be taken individually.
- **Online Discussions:** All graduate students will take part in online discussion of reading assignments. Students are expected to do at least one initial post and respond to other students on all discussion boards. All posts are to be meaningful and show thoughtful reflection about the reading and/or the post to which they are responding. (see Scoring Rubric for Online Discussions below)
- **Intellectual Commitment, Participation, and Professionalism (ICPP):** You will be studying the mathematics that you will be teaching in the future; therefore it is vitally important that you are fully engaged during the course. The Intellectual Commitment, Participation, and Professionalism Standards and Expectations for this course are:
 - ✓ Student is an active participant in class as indicated by group participation, presentations, questions, and compliments.
 - ✓ Student supports fellow classmates to make sense of problems in their own way and to present at the board when appropriate. Students should also be developing their pedagogical skills by teaching the people who are struggling.
 - ✓ Student is almost always on time and prepared for class.
 - ✓ Student is respectful of their fellow classmates
 - ✓ Student turns in assignments on time.

However, the following policy is intended to protect all members of this class: If you engage in activities that are unprofessional or prevent other group members from fully participating in, and

learning from, the class activities, you will not meet the ICCP standard and your overall course grade will be lowered. The following activities are some examples of what will result in deductions: a) if you engage in conversations not related to the assigned task that interfere with your group members' learning; (b) if your cell phone or any other electronic device is being used for purposes other than those needed for class activities (best to keep it put away); (c) if you are a passive observer in class; or (d) if you are disrespectful of fellow classmates or instructors. These behaviors, among others, are inconsistent with the professionalism required of teachers, and have detrimental effects on the class community and your group members' learning and grades.

- **Embedded tasks:** instructional tasks for which the student composes an individual, written response in class. Periodically throughout the semester, your understanding may be assessed through a few short-response questions. These may include checking for class preparedness, collecting homework, exit tickets, or in-class problems/quizzes. You will not be given prior notice as to which homework will be collected/graded or when quizzes will take place.

Except for university excused absences, there are no provisions for taking exams or handing in assignments at any time other than the scheduled time. *Personal travel is not considered a valid excuse.*

**** There are no opportunities for extra credit in this course. ****

Grades:

Final letter grades for the semester will be based on the evidence collected from evaluation opportunities and attendance policy listed above. Pluses and minuses within each of the grade ranges will be given at the discretion of the instructor. A full description for expectations within each range can be found in the course policies on the MTH2620/MTLM5020 website: <http://sites.msudenver.edu/bevans21/teaching-and-learning/mth-2620-mtlm-5020/>

Grade of B: Student consistently demonstrates understanding of course content in familiar situations and sometimes demonstrates understanding of material in novel situations. The minimum requirements for earning a “B” in the course are: a satisfactory attendance record, as described below; completion of each of the CAP assignment with a score of M (described in more detail in the scoring guide included below), a score of M on a majority (> 80%) of in-class and exam tasks; some additional evidence, either from daily work or the final exam; and with a score of M in Disposition and Professionalism demonstrating, through attendance, promptness, and attitude, the intellectual commitment to learning at the heart of outstanding teaching.

Grade of A: Student consistently demonstrates understanding of course content in both familiar and novel situations. To earn an “A” in the course, a student’s work must meet all the criteria for a grade of “B” as described above, and go beyond that in each of the following ways:

- Consistent evidence of mathematical proficiency *well beyond* that required to meet the course standard (High-quality work on written assignments throughout the semester is one source of such evidence; substantial documented evidence of proficiency from daily work is another. Meeting the standard on all in-class and exam tasks and on at least 90% of exam tasks, with no scores of (–), is summative evidence that fits this criterion);
- Regular and consistent evidence of a productive mathematical disposition and with a score of M demonstrating, through attendance, promptness, and attitude, the intellectual commitment to learning at the heart of outstanding teaching. (Documented evidence of regular participation in the daily mathematical work of the class is one way to provide this evidence. Note: prompt attendance is a class requirement, and is thus not, in and of itself, evidence of productive disposition that goes beyond that required for a grade of “B”.)

Grade of C: Student consistently demonstrates understanding of course content in familiar situations. A student will earn a “C” in the course if she or he fails to meet the criteria for a “B” but submits all CAPs with no more than 1 at a score of an IP, scores (+) or above on at least two thirds of in-class tasks, and scores (+) or above on at least 75% of the final exam problems and with a score of + or higher demonstrating, through attendance, promptness, and attitude, the intellectual commitment to learning at the heart of outstanding teaching.

Grade of D: Student sometimes demonstrates understanding of course content in familiar situations. A student will earn a “D” in the course if she or he fails to meet the criteria for a “C” but submits all CAPs with no more than 1 at a score of an IP, scores (+) or above on at least half of in-class tasks, and scores (+) or above on at least 50% final exam problems and with a score of + or higher demonstrating, through attendance, promptness, and attitude, the intellectual commitment to learning at the heart of outstanding teaching. However, this course is required for prospective teachers, and a licensure recommendation is based on, among other things, grades of “C” or better in all required courses. A student who does not earn a grade of “C” or better will have to repeat the course, so a grade of “D” is meaningless except in grade point calculations therefore is only given in cases where a student has, at the very minimum, demonstrated, through attendance, promptness, and attitude, the intellectual commitment to learning at the heart of outstanding teaching.

Grade of F: Student rarely demonstrates understanding of course content in familiar situations. A student who does not demonstrate the minimum characteristics of a “D” student, as described above, will receive a grade of “F.”

Attendance: ***Attendance is necessary in order to pass this course.*** You are expected to attend every class session, to be on time, and to stay for the entire class period. Since you will be working with a group during the semester, it is vitally important to be a responsible group member. One facet of this is your class attendance. The following policy is intended to protect all members of this class:

Your final grade will be dropped by one whole letter grade (e.g., from B+ to C+) if you miss one class. If you miss two classes, you cannot earn credit for the course. Two late arrivals and/or early departures will constitute one unexcused absence.

Attendance will be checked regularly. If you must miss all or part of a class, please notify me by e-mail as soon as possible (preferably before the absence). If you miss a class, it is your responsibility to arrange to obtain the notes, assignments, and any in-class announcements from a classmate.

Withdrawal dates - Confirm your dates on your Student Detail Schedule

Semester Dates	6/4-7/28/18 8-weeks	5/21-7/28/18 10-weeks	6/4-6/30/18 1 st 4 weeks	7/2-7/28/18 2 nd 4 weeks	5/21-6/23/18 1 st 5 weeks	6/25-7/28/18 2 nd 5 weeks
Courses:	All MTH Except MTH 1610-001 and MTH 2620	All CS Courses	ONLY MTH 2620 MTLM 5020	ONLY MTL 3600 MTLM 5600	ONLY MTH 1610 Section 001	ONLY MTL 3740 MTL 4710
100% refund	Thurs, June 7	Thurs. May 24	Before start date	Before start date	Before start date	Before start date
50% refund	Tues. June 12	Thurs. May 31	Fri. Jun 8	Fri. Jul 6	Sat. May 26	Sat. Jun 30
Last Day for W	Tues. July 10	Fri. July 6	Fri. Jun 22	Fri. Jul 20	Tues. Jun 12	Tues. Jul 17

Holiday information: Memorial Day Holiday: Monday, May 28 (No classes, Campus Closed)
Independence Day Holiday: Wednesday, July 4 (No classes, Campus Closed)

University Policies

Students are responsible for full knowledge of the provisions and regulations pertaining to all aspects of their attendance at MSU Denver, and should familiarize themselves with the following policies:

1. GENERAL UNIVERSITY POLICIES
2. GRADES AND NOTATIONS including WITHDRAWAL FROM A COURSE, ADMINISTRATIVE WITHDRAWAL, and INCOMPLETE POLICIES
Students should be aware that any kind of withdrawal can have a negative impact on some types of financial aid, including scholarships.
3. ACADEMIC DISHONESTY
4. POLICY STATEMENTS ON SEXUAL MISCONDUCT
5. ACCOMMODATIONS TO ASSIST INDIVIDUALS WITH DISABILITIES
6. CLASS ATTENDANCE
7. ELECTRONIC COMMUNICATION (STUDENT EMAIL) POLICY

For a complete description of these policies go to <https://msudenver.edu/math/policies/>

Analyses of Mathematical Thinking (AMTs):

Each AMT will have a scoring rubric based on the learning objectives for the assignment and each problem. All rubric categories must meet the standard to receive an overall “Meets” grade on the assignment. In general, AMT scores will follow these guidelines:

General Scoring Guide for AMTs and other Outside-of-Class Assignments

	No Revision Needed (Score of M)	Revision Needed (In Progress*)
Mathematical Content	<p>Meets the Standard:</p> <ul style="list-style-type: none"> • Correctly answers the questions posed. • Demonstrates working understanding of the important mathematical ideas underlying the problem. • Clearly explaining the processes you followed in your work on the problem: e.g., how you got started, the assumptions you made, what you tried, what worked, what did not work, any diagrams, tables, graphs you made. • Analyzes mathematical ideas in ways that are sound both from a mathematical perspective and with respect to learning goal to be demonstrated. <p><u>For Revisions also include:</u> Revision includes clear description of aspects of original being revised and why.</p>	<p>In Progress</p> <p>A first draft.</p> <ul style="list-style-type: none"> • Some of the questions have been addressed but not completed. • Some of the mathematical ideas underlying the problem have been identified but not followed through completely. • Explanations or justifications are missing or incomplete; • The processes followed are not fully described.
Communication	<p>Meets the Standard:</p> <ul style="list-style-type: none"> • Your name on each page. • Statement(s) of the problems to be solved. • Thoughtfully answering each of the questions posed • Supporting assertions, opinions and conclusions with evidence gathered from appropriate sources. • Grammatically correct, clear and legible writing. <p><u>For Revisions also include:</u> Revision is on separate pages with original attached.</p>	<p>In Progress</p> <p>A first draft; some of the features of clear mathematical communication described to meet the standard are missing.</p>

*** *In Progress work requires revision to receive a score. A student’s final grade will drop one full letter grade for each AMT that is not revised to a level of “M” by the end of the semester due date. See “Revisions” section below.***

Revisions: Any outside-of-class assignment assessed as “In Progress” must be revised and improved. When you revise your work:

- write your revisions on separate paper and attach to your earlier drafts before submitting (do not re-write the entire assignment unless I ask you to do so); and
- include in your revisions a section in which you discuss your original thinking on the problem, how your understanding has changed, and what you have learned by revising your work.

Note: Only AMTs submitted by the due date may be revised. Only revisions submitted within one week after the first draft was returned to the student will be scored.

In-Class Assignments, including Exams and Quizzes

In-class assignments will have a scoring rubric based on the learning objectives for the assignment and each problem. An assignment grade will be given based on the rubric and credit earned. There are no revisions for in-class assignments. In general, in-class assignment scores will follow these guidelines:

General Scoring Rubric for In-Class Assignments

Score	Criteria
Clearly Meets the Standard: (M)	<ul style="list-style-type: none">• Response is clearly written and correctly answers the questions posed.• Justification is presented to support the response. Full credit for problem earned.
Partially Meets the Standard: (+)	<ul style="list-style-type: none">• Does not meet all of the criteria for (M).• Minor errors, but there is some evidence of understanding of the big idea(s) addressed by the problem.
Almost Meets the Standard: (-)	<ul style="list-style-type: none">• Does not meet all of the criteria for (+).• Some errors but answer shows some awareness of ideas relevant to the problem.
Below Standard: (0)	<ul style="list-style-type: none">• Does not meet the criteria for (-).• Major errors, or absence of any evidence of how answers were obtained. No credit earned for problem.

Scoring Rubric for Online Discussions

M+	<ul style="list-style-type: none">• Student meets the criteria for a 5 listed below• Student is very active on the discussion board, often responding to several posts each week.• Student's comments on the discussion board are thoughtful, respectful of others' opinions, and clearly stated.
M	<ul style="list-style-type: none">• Student posts an initial post, responds to at least one other student on all discussion boards, and responds to more than one other student on at least half of the discussion boards• All posts are meaningful and show thoughtful reflection about the reading and/or the post they are responding to• At least 90 % of the student's posts are made on time.
+	<ul style="list-style-type: none">• Student posts an initial post and responds to at least one other student on 90% of the discussion boards.• All posts are meaningful and show thoughtful reflection about the reading and/or the post they are responding to• At least 80 % of the student's posts are made on time.
-	<ul style="list-style-type: none">• Student posts an initial post and responds to at least one other student on 75% of the discussion boards.• Most posts are meaningful and show thoughtful reflection about the reading and/or the post they are responding to• At least 60% of the student's posts are made on time.
0	<ul style="list-style-type: none">• Student posts a meaningful initial post and at least one meaningful reply on 50% of the discussion boards.