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M 301.01: Teaching Mathematics with Technology

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TEACHING MATHEMATICS WITH TECHNOLOGY
MATHEMATICS 301 SECTION 1
CRN 7451

INSTRUCTOR

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WEBPAGE

<https://moodle.UMT.edu/>

OUTCOMES

Upon completion of this course, a student will be able to:

1. Explain and engage in the mathematical modeling process;
2. Use technology to graph, compute, organize and investigate;
3. Use technology to model continuous and discrete settings;
4. Use technology to model probabilistic settings using simulation;
5. Evaluate models using goodness of fit measures;
6. Discover, share and communicate mathematical ideas using information and communication technology (ICT).
7. Use a variety of technologies to facilitate and enhance the teaching and learning of mathematics;

TEXTS

National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common core state standards for mathematics*. Washington D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.

http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf.

Consortium for Mathematics and its Applications (COMAP) & Society for Industrial and Applied Mathematics (SIAM). (2016). *GAIMME: Guidelines for Assessment & Instruction in Mathematical Modeling Education*. Bedford, MA: COMAP

<http://www.siam.org/reports/gaimme.php>.

Bargagliotti, A. et al. (2020). *Pre-K–12 Guidelines for Assessment and Instruction in Statistics Education II (GAISE II)*. Alexandria, VA: ASA
https://www.amstat.org/asa/files/pdfs/GAISE/GAISEIIPreK-12_Full.pdf.

GRADING 30% Technology Exercises
20% Readings
30% Modeling Projects
20% Final Exam

GRADE SCALE Let S be your final score in the course then,

93	\leq	S	$<$	100	\Rightarrow	A
90	\leq	S	$<$	93	\Rightarrow	A-
87	\leq	S	$<$	90	\Rightarrow	B+
83	\leq	S	$<$	87	\Rightarrow	B
80	\leq	S	$<$	83	\Rightarrow	B-
75	\leq	S	$<$	80	\Rightarrow	C+
70	\leq	S	$<$	75	\Rightarrow	C
65	\leq	S	$<$	70	\Rightarrow	C-
62	\leq	S	$<$	65	\Rightarrow	D+
58	\leq	S	$<$	62	\Rightarrow	D
55	\leq	S	$<$	58	\Rightarrow	D-
0	\leq	S	$<$	55	\Rightarrow	F

TECHNOLOGY EXERCISES Generally, every week over the semester I will present the class with an exercise that will provide a basis for mathematical investigation aided by a particular technology. Each of these investigations will provide you the opportunity to learn how to use technology in the classroom to facilitate the construction of mathematical content knowledge. Exercises will generally be due one week after their introduction. Each student's collection of technology exercises will serve as a resource for the final exam.

READINGS Each Monday of the semester you will be provided with a reading. Readings are meant to complement the active learning carried out in both the technology exercises and modeling projects by providing the student with an opportunity to reflect upon teaching and learning of mathematics with technology. Each student will be asked to participate in a discussion forum where the ideas in each reading will be discussed. Your responses in these discussion forums will be graded using a rubric which I will provide.

MODELING PROJECTS There will be three modeling projects in the course. These projects will provide you the opportunity to apply your mathematical instincts to empirical settings to gain understanding and/or improve decision-making. Each project will be announced in class and will be due three to four weeks later.

FINAL EXAM There will be a final exam in the course to assess student progress towards the course's learning outcomes. Students will be allowed to use any self-authored materials (i.e. technology exercises, modeling projects) as resources for the completion of the exam.

HONESTY

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review at <http://www.umt.edu/student-affairs/dean-of-students/default.php>.

ACCOMMODATION

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit <http://www.umt.edu/disability> for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

IMPORTANT DATES

September 20th is the last day to drop or add the course using Cyberbear. November 1st is the last day to drop with instructor and advisor signatures (W appears on transcript). December 10th is the last day to drop the course or change grading option using a late drop form (WP/WF appears on transcript). Acceptable reasons for a late drop are listed in the university catalog and are limited to: accident, illness, family emergency or a change in work schedule. The following examples are not considered sufficient for a late drop: protecting GPA, forgetting to turn in the change slip, losing financial aid, losing eligibility to engage in sports.

SEMESTER SCHEDULE

Monday	Wednesday	Friday
Aug 30 Statistics	Sep 1 Statistics	Sep 3 Statistics
Sep 6 Labor Day	Sep 8 Statistics	Sep 10 Statistics
Sep 13 Statistics	Sep 15 Statistics	Sep 17 Statistics
Sep 20 Probability	Sep 22 Probability	Sep 24 Probability
Sep 27 Probability	Sep 29 Probability	Oct 1 Probability
Oct 4 Geometry	Oct 6 Geometry	Oct 8 Geometry
Oct 11 Geometry	Oct 13 Geometry	Oct 15 Geometry
Oct 18 Geometry	Oct 20 Geometry	Oct 22 Geometry
Oct 25 Geometry	Oct 27 Geometry	Oct 29 Geometry
Nov 1 Algebra	Nov 3 Algebra	Nov 5 Algebra
Nov 8 Algebra	Nov 10 Algebra	Nov 12 Algebra
Nov 15 Algebra	Nov 17 Algebra	Nov 19 Algebra
Nov 22 Functions	Nov 24 Thanksgiving	Nov 26 Thanksgiving
Nov 29 Functions	Dec 1 Functions	Dec 3 Functions
Dec 6 Functions	Dec 8 Functions	Dec 10 Functions
Final Exam Wednesday, December 15, 8:00-10:00AM		