

Syllabus

MAT 108: Modern Concepts of Mathematics.

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Course Description

Modern Concept of Mathematics is an introductory course for non-math majors. This course uses applications from the world today to combine critical thinking with mathematical skills. Quantitative problem-solving techniques and decision-making methods are applied toward both personal and professional experiences in everyday living.

Credit Hours: 3

Prerequisite Courses: None

Prerequisite Skills and Knowledge: Students should be able to use a calculator.

Course Outcomes

Upon successful completion of this course, students should be able to:

- Communicate quantitative problems and their solutions clearly and correctly in written or oral form.
 - Utilize critical thinking skills to evaluate quantitative information in everyday life.
 - Formulate a plan based on the mathematical concepts that apply to a problem.
 - Describe the relationships among quantitative information in real world applications.
 - Analyze the mathematical relationships and patterns that confront the modern world.
 - Recognize connections between mathematics and musical scales.
 - Demonstrate the mathematical concepts of proportion and symmetry in artistic expressions.
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Course Textbook

This course does not use any textbook; it uses Open Educational Resources (OER). IWU is committed to decreasing the cost of textbooks and resources for our National & Global students. We are utilizing embedded digital resources whenever possible. All resources are listed at the bottom of this syllabus and also within each workshop.

IWU Diversity Statement

IWU, in covenant with God's reconciling work and in accordance with the Biblical principles of our historic Wesleyan tradition, commits to build a community that reflects Kingdom diversity. We will foster an intentional environment for living, teaching and learning, which exhibits honor, respect, and dignity. Acknowledging visible or invisible differences, our community authentically values each member's earthly and eternal worth. We refute ignorance and isolation and embrace deliberate and courageous engagement that exhibits Christ's commandment to love all humankind.

Onsite Classes

1. Onsite classes will use the discussion forums to award course points. Onsite classes can use the discussion forum prompts for in-class discussions.
 - a. By policy, instructors are not permitted to assign discussion forums as assignments to be completed outside of class time.
 - b. There are to be NO peer posting expectations for onsite classes. No exceptions.
 - c. Your students may voluntarily prepare for discussions, but you may not require them to make a primary post for grading outside of class time.
2. If the class is canceled due to weather, then discussion forum primary posts and peer posts may be assigned and required as part of the online weather emergency strategy.
3. If students are absent from class, then instructors may allow those students to post in the discussion forums to earn some of those points.

Other than the discussion forums, students in onsite classes are required to complete all other assignments (homework, quizzes, tests, assignments).

Grading Scale

Grade	Quality Points Per Credit	Percentage	Score
A	4.0	95%–100%	950–1000

Grade	Quality Points Per Credit	Percentage	Score
A-	3.7	92%–94.9%	920–949
B+	3.3	89%–91.9%	890–919
B	3.0	85%–88.9%	850–889
B-	2.7	82%–84.9%	820–849
C+	2.3	79%–81.9%	790–819
C	2.0	75%–78.9%	750–789
C-	1.7	72%–74.9%	720–749
D+	1.3	69%–71.9%	690–719
D	1.0	65%–68.9%	650–689
F	0.0	0%–64.9%	0–649

Note: In graduate level courses, a grade of C- or below will require the course to be repeated.

Grading Policies

Your grading policy for your course is dependent on your school and program. Your grading policies can be found in the [IWU Catalog](#).

Letter Grade Equivalencies

Grade	Quality Points Per Credit
A	Clearly stands out as excellent performance. Has unusually sharp insights into material and initiates thoughtful questions. Sees many sides of an issue. Articulates well and writes logically and clearly. Integrates ideas previously learned from this and other disciplines. Anticipates next steps in progression of ideas. Example "A" work should be of such nature that it could be put on reserve for all cohort members to review and emulate. The "A" cohort member is, in fact, an example for others to follow.
B	Demonstrates a solid comprehension of the subject matter and always accomplishes all course requirements. Serves as an active participant and listener. Communicates orally and in writing at an acceptable level for the degree program. Work shows intuition and creativity. Example "B" work indicates good quality of performance and is given in recognition for solid work; a "B" should be considered a good grade and awarded to those who submit assignments of quality less than the exemplary work described above.
C	Quality and quantity of work in and out of class is average. Has marginal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at least minimally.
D	Quality and quantity of work is below average. Has minimal comprehension, communication skills, or initiative. Requirements of the assignments are addressed at below acceptable levels.
F	Quality and quantity of work is unacceptable and does not qualify the student to progress to a more advanced level of work.

Note: In graduate level courses, a grade of C- or below will require the course to be repeated.

Grade Summary

Workshop	Discussion	Assignment	Quiz	Total Points per Workshop
Workshop One	2/40	1/30	1/90	160
Workshop Two	2/30	1/120	1/90	240
Workshop Three	2/40	1/80	1/60	180
Workshop Four	2/30	1/120	1/60	210
Workshop Five	3/60	0	2/150	210
TOTAL	11/200	4/350	6/450	1000

Workshop Outlines

Workshop One Outline

Title	Due Dates	Time	Points
1.1 Discussion: Biblical Wisdom	Post your initial response by the end of the fourth day of the workshop and your two responses by the end of the workshop.	2 hours	10
1.2 Discussion: Problem Solving	Post your initial response by the end of the fourth day of the workshop and your two responses by the end of the workshop.	3 hours	30
1.3 Assignment: Professional Athlete	Due by the end of the workshop.	3 hours	30
1.4 Quiz: Workshop One	Due by the end of the workshop.	6 hours	90
Totals		14 hours*	160

*These times are only estimates. Actual completion times will vary.

Workshop Two Outline

Title	Due Dates	Time	Points
2.1 Discussion: Biblical Wisdom	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	2 hours	10
2.2 Discussion: Percentages	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	3 hours	20
2.3 Assignment: Presentation	Due by the end of the workshop	7 hours	120
Totals		17 hours*	240

Title	Due Dates	Time	Points
2.4 Quiz: Workshop Two	Due by the end of the workshop	5 hours	90
Totals		17 hours*	240

*These times are only estimates. Actual completion times will vary.

Workshop Three Outline

Title	Due Dates	Time	Points
3.1 Discussion: Biblical Wisdom	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	2 hours	10
3.2 Discussion: Math & the Arts	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	3 hours	30
3.3 Assignment: Composer or Artist	Due by the end of the workshop	7 hours	80
3.4 Quiz: Workshop Three	Due by the end of the workshop	5 hours	60
Totals		17 hours*	180

*These times are only estimates. Actual completion times will vary.

Workshop Four Outline

Title	Due Dates	Time	Points
4.1 Discussion: Biblical Wisdom	Post your initial response by the end of the fourth day; two responses by the end of the workshop	2 hours	10
4.2 Discussion: Conditional News	Post your initial response by the end of the fourth day; two responses by the end of the workshop	3 hours	20
4.3 Assignment: Presentation	Due by the end of the workshop	7 hours	120
4.4 Quiz: Workshop Four	Due by the end of the workshop	5 hours	60
Totals		17 hours*	210

*These times are only estimates. Actual completion times will vary.

Workshop Five Outline

Title	Due Dates	Time	Points
5.1 Discussion: Biblical Wisdom	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	2 hours	10
5.2 Discussion: Sports Polls	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	3 hours	20
5.3 Discussion: Voting Methods	Post your initial response by the end of the fourth day; your two responses by the end of the workshop	3 hours	30
5.4 Quiz: Workshop Five	Due by the end of the workshop	5 hours	60
Totals		18.5 hours*	210

Title	Due Dates	Time	Points
5.5 Quiz: Final Exam	Due by the end of the workshop	5 hours	90
End of Course Survey	Due by the end of the workshop	30 minutes	10 extra credit
Totals		18.5 hours*	210

*These times are only estimates. Actual completion times will vary.

Outline Totals

Total Time	Total Points
86.5 hours*	1000

* These timings are based on estimations of average times to complete each activity. Actual activity completion times will vary.

Alternative Assignment Policy

Students with a documented disability may request accommodations for an alternative assignment(s) for course activities (Examples: video assignments, etc.). It is the student's responsibility to submit the form received from the Disability Services Office indicating his/her specific accommodation to the instructor prior to the start of each course.

Expectations, Policies, and Important Student Information

School/Division	Link
DeVoe School of Business Division of Liberal Arts School of Services and Leadership	View School/Division Expectations, Policies, and Student Information
School of Educational Leadership	View School/Division Expectations, Policies, and Student Information
Wesley Seminary @ IWU	View School/Division Expectations, Policies, and Student Information
Nursing - Undergraduate	View School/Division Expectations, Policies, and Student Information
Nursing - Graduate	View School/Division Expectations, Policies, and Student Information

Course Resources

Workshop One:

A guide to problem solving. (n.d.). Retrieved from <https://nrich.maths.org/10218>

Activity: Currency conversion. (n.d.). Retrieved from <https://www.mathsisfun.com/activity/currencies.html>

Adding fractions. (n.d.). Retrieved from https://www.mathsisfun.com/fractions_addition.html

Decimals. (n.d.). Retrieved from <https://www.mathsisfun.com/decimals.html>

Exchange Rates *Segment 1 only* <https://oak.indwes.edu/record=b1289038>

Fractions. (n.d.). Retrieved from <https://www.mathsisfun.com/decimals.html>

How to safely convert from one unit to another. (n.d.). Retrieved from <https://www.mathsisfun.com/measure/unit-conversion-method.html>

Index notation and powers of 10. (n.d.). Retrieved from <https://www.mathsisfun.com/index-notation-powers.html>

Khan Academy. (2010, September 6). U.S. customary and metric units | Ratios, proportions, units, and rates | Pre-Algebra | Khan Academy [video file].

Retrieved from <https://www.youtube.com/watch?v=y2RHWA7t0WM>

Metric - US/Imperial conversion charts. (n.d.). Retrieved from <https://www.mathsisfun.com/metric-imperial-conversion-charts.html>

Mr. Causey. (2010, November 7). How to use unit analysis | Dimensional analysis [video file]. Retrieved from <https://www.youtube.com/watch?v=XbNylweG47M>

Multiplying fractions. (n.d.). Retrieved from https://www.mathsisfun.com/fractions_multiplication.html

Polya's problem solving techniques. (n.d.). Retrieved from <https://math.berkeley.edu/~gmelvin/polya.pdf>

Practice aptitude tests. (2013, October 25). Currency conversion [video file]. Retrieved from <https://www.youtube.com/watch?v=YDEI9jjYt6E>

Rounding Numbers

<https://www.mathsisfun.com/rounding-numbers.html>

Secret to solving math word problems. Hint: It is not about math. (2017, November 12). Retrieved from <https://mindprintlearning.com/blog/solving-word-problems/>

Temperature Conversion

<https://www.mathsisfun.com/temperature-conversion.html>

Trent Online. (2016, September 6). Unit analysis and problem solving [video file]. Retrieved from <https://www.youtube.com/watch?v=vpL5SGi6Kkc>

Unit analysis. (n.d.). Retrieved from https://www.varsitytutors.com/hotmath/hotmath_help/topics/unit-analysis

Workshop Two:

3B putting numbers in perspective. (n.d.). Retrieved from <http://www.math.wisc.edu/~meyer/math141/L8.html>

Decimals, fractions and percentages. (n.d.). Retrieved from <https://www.mathsisfun.com/decimal-fraction-percentage.html>

Definition of inflation. (n.d.). Retrieved from <https://www.mathsisfun.com/definitions/inflation.html>

Errors in measurement. (n.d.). Retrieved from <https://www.mathsisfun.com/measure/error-measurement.html>

[Exponents and Scientific Notation](#) *Segment 1 only*

[Fractions](#)

Index numbers. (n.d.). Retrieved from <https://slideplayer.com/slide/8268129/>

Khan, S. (n.d.). 2-step estimation problem: Marbles [video file]. Retrieved from <https://www.khanacademy.org/math/in-in-class-6th-math-cbse/in-in-6th-know-numbers/in-in-6th-know-numbers-rounding-whole-nos/v/marbles-for-friends>

Khan, S. (n.d.). *Intro to ratios* [video file]. Retrieved from <https://www.khanacademy.org/math/pre-algebra/pre-algebra-ratios-rates/pre-algebra-ratios-intro/v/ratios-intro>

Khan, S. (n.d.). *Ratios, rates, and proportions — Basic example* [video file]. Retrieved from <https://www.khanacademy.org/test-prep/sat/sat-math-practice/new-sat-problem-solving-data-analysis/v/sat-math-q1-easier>

Khan, S. (n.d.). *Ratios, rates, and proportions — Harder example* [video file]. Retrieved from <https://www.khanacademy.org/test-prep/sat/sat-math-practice/new-sat-problem-solving-data-analysis/v/sat-math-q1-harder>

Lewitt, K. (2014, September 19). Uses and abuses of percentages. Retrieved from <https://prezi.com/lq4nd0anej3h/uses-and-abuses-of-percentages/>

[Misleading Statistics](#)

[Multiplying Fractions](#)

[Multiplying Numbers in Scientific Notation](#)

Percentage change. (n.d.). Retrieved from <https://www.mathsisfun.com/numbers/percentage-change.html>

Percentages (%). (n.d.). Retrieved from <https://www.mathsisfun.com/percentage.html>

ProjectResolute. (2017, February 24). Taking a perspective look into big numbers. Retrieved from <https://owlcation.com/stem/How-big-is-a-Number>

Ratios. (n.d.). Retrieved from <https://www.mathsisfun.com/numbers/ratio.html>

Rounding numbers. (n.d.). Retrieved from <https://www.mathsisfun.com/rounding-numbers.html>

[Rules of Exponents](#)

Scientific notation. (n.d.). Retrieved from <https://www.mathsisfun.com/numbers/scientific-notation.html>

[Unit Conversion Tutor - Scientific Notation Examples](#)*Start video at 19:30*

Workshop Three:

Genius of the East: Fibonacci Sequence *Segment 24 only*

https://fod.infobase.com/p_ViewVideo.aspx?xtid=40030&loid=67312

Golden ratio. (n.d.). Retrieved from <https://www.mathsisfun.com/numbers/golden-ratio.html>

Harmonious Math: Vibrating Molecules *Segment 2 only*

https://fod.infobase.com/p_ViewVideo.aspx?xtid=110271&loid=405079

Intro to proportional relationships [video file]. (n.d.). Retrieved from

<https://www.khanacademy.org/math/pre-algebra/pre-algebra-ratios-rates/pre-algebra-proportional-rel/v/introduction-to-proportional-relationships>

Khan, S. (n.d.). *Identifying symmetrical figures* [video file]. Retrieved from

<https://www.khanacademy.org/math/basic-geo/basic-geo-transformations-congruence/line-of-symmetry/v/identifying-symmetrical-figures>

Khan, S. (n.d.). *The golden ratio* [video file]. Retrieved from

<https://www.khanacademy.org/math/geometry-home/geometry-lines/the-golden-ratio/v/the-golden-ratio>

Nature, the golden ratio, and Fibonacci too. (n.d.). Retrieved from

<https://www.mathsisfun.com/numbers/nature-golden-ratio-fibonacci.html>

Numbers as God: Hidden Mathematical Patterns *Segment 4 only*

<https://go.openathens.net/redirector/indwes.edu?url=https%3a%2f%2ffod.infobase.com%2fPortalPlaylists.aspx%3fwID%3d98671%26xtid%3d169041%26loid%3d541765>

SantoPietro, D. (n.d.). *Sound Properties: Amplitude, period, frequency, and wavelength* [video file]. Retrieved from

<https://www.khanacademy.org/science/ap-physics-1/ap-mechanical-waves-and-sound/introduction-to-sound-waves-ap/v/sound-properties-amplitude-period-frequency-wavelength>

Tilings in the world around us. (n.d.). Retrieved from

<http://pi.math.cornell.edu/~mec/2008-2009/KathrynLindsey/PROJECT/Page1.htm>

Zucker, S., & Harris, B. (n.d.). *How one-point linear perspective works* [video file]. Retrieved from

<https://www.khanacademy.org/humanities/renaissance-reformation/early-renaissance1/beginners-renaissance-florence/v/how-one-point-linear-perspective-works>

Zucker, S., & Harris, B. (n.d.). *Linear perspective: Brunelleschi's experiment* [video file]. Retrieved from

<https://www.khanacademy.org/humanities/renaissance-reformation/early-renaissance1/beginners-renaissance-florence/v/linear-perspective-brunelleschi-s-experiemnt>

Workshop Four:

Bazett, T. (2017, May 17). *Conditional statements: If p then q* [Video file]. Retrieved from

<https://www.youtube.com/watch?v=F3544ZyO-eU>

Christensen, E. (2017, July 18). Venn diagram symbols explained. Retrieved from

<https://www.lucidchart.com/blog/venn-diagram-symbols-explained>

Hildebrand, S. (2015, December 6). 1A Living in the media age. Retrieved from

<https://prezi.com/cc9x1qpbjk39/1a-living-in-the-media-age/>

Introduction to sets. (n.d.). Retrieved from

<https://www.mathsisfun.com/sets/sets-introduction.html>

Mometrix Academy. (2018, August 28). *Top 10 logical fallacies (2018)* [Video] file. Retrieved from

<https://www.youtube.com/watch?v=IawIjqOJBU8>

Mometrix Academy. (2018, December 11). *Understanding various types of logical fallacies* [Video file]. Retrieved from

<https://www.youtube.com/watch?v=UzT4L0Zt4ZY>

TED-Ed. (2016, March 15). *5 tips to improve your critical thinking - Samantha Agoos* [Video file]. Retrieved from

<https://www.youtube.com/watch?v=dItUGF8GdTw>

TheTrevTutor. (2017, July 17). *[Discrete math 1] Introduction to propositional logic* [Video file]. Retrieved from

<https://www.youtube.com/watch?v=itrXYg41-V0>

Workshop Five:

Examples of voting methods (2). (n.d.). Retrieved from <https://plato.stanford.edu/entries/voting-methods/#2>

Mathispower4u. (2013, August 22). *Introduction to voting theory and preference tables* [video file]. Retrieved from

<https://www.youtube.com/watch?v=6rhpq1ozmuQ&list=PLROOIV7hGpZjbf1ToXX5z2dmVAh4QHz2G&index=2&t=14s>

Mathispower4u. (2013, August 22). *Voting theory: Borda count* [video file]. Retrieved from

<https://www.youtube.com/watch?v=hVG9jmA4FBU&list=PLROOIV7hGpZjbf1ToXX5z2dmVAh4QHz2G&index=8&t=32s>

Mathispower4u. (2013, August 22). *Voting theory: Fairness criterion* [video file]. Retrieved from

<https://www.youtube.com/watch?v=CuOLQT9P11I&list=PLROOIV7hGpZjbf1ToXX5z2dmVAh4QHz2G&index=3&t=26s>

Mathispower4u. (2013, August 22). *Voting theory: Plurality method and Condorcet criterion* [video file]. Retrieved from

<https://www.youtube.com/watch?v=r-VmxJQFMq8&list=PLROOIV7hGpZjbf1ToXX5z2dmVAh4QHz2G&index=4&t=289s>

The problem: Who should be elected? (1). (n.d.). Retrieved from <https://plato.stanford.edu/entries/voting-methods/#1>