MICHIGAN STATE UNIVERSITY
MTH 102 – SPRING 2017
QUANTITATIVE LITERACY II
SYLLABUS

CONTACT INFORMATION AND OFFICE HOURS.
Instructor: Dr. Bronlyn Wassink
Email: wassinkb@math.msu.edu
Office Location: C136 Wells Hall
Office Hours: Mondays and Wednesdays from 11am to 12:30pm in C136 Wells Hall, and by appointment.

Recitation Leader: Jason Mckelvey   Email: mckelv23@msu.edu

Recitation Leader: Kathryn Appenzeller   Email: appenze2@msu.edu

Recitation Leader: Cameron Berry   Email: berrycam@msu.edu

Recitation Leader: William Humes   Email: humeswil@msu.edu

For office locations and office hours of the recitation leader, please see D2L.

Additional tutoring help : time and locations available on D2L.

If you have questions about the content that we are discussing in class, you may use the additional tutoring help, office hours of the instructor, or office hours of ANY of the recitation leaders (even the people who are not the recitation leader for your Thursday section). If you have a question about your grades, accommodations, or extenuating circumstances that affect your engagement with this class, it is best to make an appointment with Dr. Wassink.

CLASS TIMES AND LOCATIONS.

Tuesday Lecture: 1:00-2:20pm, B117 Wells Hall. Instructor: B. Wassink
Recitations:
Section 001 – Thurs, 1:00-2:20pm, 304 EBH. Recitation leader: J. Mckelvey
Section 002 – Thurs, 1:00-2:20pm, 136 CEM. Recitation leader: W. Humes
Section 003 – Thurs, 1:00-2:20pm, 119 PSY. Recitation leader: K. Appenzeller
Section 004 – Thurs, 2:40-4:00pm, A330 Wells Hall. Recitation leader K. Appenzeller
Section 005 – Thurs, 2:40-4:00pm, A318 Wells Hall. Recitation leader: C. Berry
Section 006 – Thurs, 2:40-4:00pm, A118 Wells Hall. Recitation leader: W. Humes

COURSE GOALS & OBJECTIVES.

The purpose of this course is to provide you with opportunities to work with your classmates and your instructor to analyze quantitative information. We will learn appropriate math, statistics, and technology skills and use them as a lens to explore complex real-life situations. Several of the main content-specific learning goals are listed below. These learning objectives will be addressed throughout the course, and are incorporated into each context-based module.

- Make predictions about quantitative situations and check predictions against data in order to determine reasonableness, identify alternatives, and make choices.
- Critically analyze quantitative information and recognize that mathematical and statistical methods have limits.
- Interpret mathematical models of social issues and public policy in the form of formulas, graphs, tables, and images, and draw inferences from them.
- Represent mathematical information in different ways including: visually, numerically, verbally, and symbolically.
- Use arithmetic, algebraic, geometric and statistical methods to understand problems.
- Understanding the math behind voting systems and the electoral college, and the limitations of alternatives to our current voting systems.
- Recognizing how to use graphs to help detect gerrymandering or other forms of unequal distributions of representation.
- Understanding correlation vs causation;
- Understanding financial basics, such as CPI and inflation, interest, structured vs. unstructured loans, monthly payments, exponential growth of savings, APY, APR, the stock market, etc.
- Recognize the difference between a marginal tax rate and an effective tax rate.
- Be able to compute taxes owed by millage rates and use percentages to determine exactly how much of your individual taxes went to particular government programs.

COURSE MATERIALS.
1. You are required to bring a scientific calculator to class every day. It is your responsibility to make sure your calculator has batteries, that you know how to use your calculator, and that you remember to bring your calculator to exams.
2. Printed course notes that are available on D2L. Print these notes before coming to class, and use them to follow along in lecture!
3. All of the remaining materials necessary for the course will be available on D2L and through the internet; there is no textbook for this course.
4. Computer access will be necessary outside of the classroom, in accordance with MSU's student computer policy.

COURSE GRADE and EXAM DATES

The weights of your course grades will be as follows:
- Lecture Worksheets (LW): 5%
- Homework (HW): 8%
- Labs (Recitation Group work): 15%

- Research Project: 20%
- Test 1 (February 9): 9%
- Test 2 (March 23): 9%
- Test 3 (April 20): 9%
- Final Exam (Monday, May 1 2017 12:45pm - 2:45pm in B117 Wells Hall): 25%

Your course grade will be assigned based on the weighted average of your performance in the above categories. The grades will be assigned as follows:

4.0	3.5	3.0	2.5	2.0	1.5	1.0	0
90%-100%	85% - 89%	80% - 84%	75% - 79%	70% - 74%	65% - 69%	60% - 64%	Below 60%

ATTENDANCE POLICY
Attendance is mandatory. You will not receive a grade for solely or attendance, but your attendance is crucial to your success in the course. Many assignments will be completed collaboratively, in-class, which provides a unique learning opportunity that cannot be replicated as an individual make-up assignment. See the Policy on Missed Classes below.

DESCRIPTIONS AND POLICIES OF ASSESSMENTS.
1. Lecture Worksheets (LW): 5% of your overall grade
   > Almost every Tuesday, there will be a worksheet to complete in class. Depending on the contents of the worksheet, sometimes this worksheet will be completed at the beginning of class, and sometimes it will be at the end of class. If you come to class late or leave early, you may miss the lecture worksheet. These activities can not be made up, however, to accommodate for illnesses and personal emergencies, we will drop the two lowest lecture worksheet grades when determining your course grade. Please see the "policy for missed classes" below for more information.
2. Homework (HW): 8% of your overall grade.
   > Homework assignments will be available on D2L and are to be submitted online. Some homework questions will be practicing skills that you learned in class, some will be questions that ask you to review background material that are prerequisite skills for the course (but you might have forgotten), and some homework questions will involve watching online videos and answering questions about them. As these are all online, we will not be dropping any of your homework scores when determining your overall grade.
3. Labs: 15% of your overall grade.
   - Labs will all be done in class on Thursdays with a group of your classmates.
   - Each lab will be worth 10 points, which will be determined by all the activities you do in class that day:
     - 5 points will be based on "engagement." Sometimes in recitation you will be working on a worksheet, and other times you will be participating in an activity that is not a worksheet. To receive the full 5 points for engagement, it is

expected that you are actively participating in the activity, or, if there is a worksheet, that you are diligently working with your group members on the assignment. It is expected that you are not texting, gossiping, or discussing things not related to the assignment. It is possible for different members of the group to get different engagement points for the week.

- The additional 5 points will be based on the correctness of the material that your group completes on the week's worksheet.

● Students who are late, leave early, or attend and do not participate at all may lose some or all of the points for that week's lab.

● These labs can not be made up. However, to accommodate for illness and personal emergencies, we will be dropping the lowest two lab grades when determining your overall grade. See the "policy for missed classes" section below.

4. Tests. There are 3 tests; Feb 29, March 23, April 20. Each is worth 9%.
    For each test, you may have **a calculator and one formula sheet** (one 8½ by 11 inch sheet of paper, which may be handwritten or printed, and may have examples, definitions, and formulas on both front and back).
    It is your responsibility to remember to bring a calculator!
    There are no make up tests. See the "policy on missed classes."
    There will be multiple versions of every test. Students caught cheating on any test will be given a 0 on the entire test (not just the question that was cheated on), and have an academic dishonesty report filed with the university. Talking to classmates, using a cell phone (even if it is only being used as a calculator), sharing calculators or formula sheets, etc. are considered cheating.

5. Research Projects: 20% of your overall grade.
    The research project will be discussed in class and have all necessary information available on D2L. This project will span the entire semester, and utilize many of the skills that we learn in class.

6. Final Exam: 25% of your overall grade.
    The final exam is cumulative. You may have 2 formula sheets and a calculator. There will be multiple versions of the final exam. Students caught cheating on the final exam will be given a 0 on the entire exam (not just the question that was cheated on), and have an academic dishonesty report filed with the university. Talking to classmates, using a cell phone (even if it is only being used as a calculator), sharing calculators or formula sheets, etc. are considered cheating.

FINAL EXAM REMEDIATION POLICY

● If you scored higher on the final exam than on your lowest test grade, then, when calculating your course grade, we will replace your lowest test grade with the average of the lowest test grade and your final exam grade. The only exception is if you scored a 0 for cheating on an exam; a 0 for cheating can not be replaced by its average with the final exam grade.

- For example, if your test grades are Test 1 = 78%, Test 2 = 42%, Test 3 = 61%, and your final exam grade is 70%, then, since 70% is higher than the lowest test grade of 42%, we will replace the 42% with (42%+70%)/2 = 56%. In other words, we will use Test 1 = 78%, Adjusted Test 2 = 56%, Test 3 = 61%, and Final Exam = 70% when calculating your course grade.

POLICY ON MISSED CLASSES.

We expect that you will attend all course meetings; you are responsible for all of the material covered in class and in the homework. Some assignments will be completed during class, in groups, so you will be unable to earn those points if you miss class.

- If you miss a class day with a test.
    - If you know ahead of time that you need to miss a test, you need to talk to Dr. Wassink and ask for approval to be excused from the test. These excusals only happen in extreme circumstances, so please do not assume that your excuse will be approved until after you speak with her. You need to have the excuse approved at least two weeks before the missed test.
    - If you miss a test because of a sudden and severe medical emergency, you will need to provide a doctor's note that explicitly states that you are too ill to attend class. A doctor's note that simply shows that you were at the doctor's office that day is not sufficient.
- If you miss a class day with a lecture worksheet or lab.
    - Two lecture worksheets and two labs will be dropped this semester. The purpose of dropping these assignments is to accommodate for illnesses, grief absences, and personal/family emergencies. Having an illness, grief absence, or personal emergency does **not** mean that an additional worksheet or lab will be dropped when determining your course grade.
    - If you are having extreme circumstances that will cause you to miss 3 or more lectures or 3 or more labs, you need to make an appointment with Dr. Wassink to discuss if you might be eligible for additional excused worksheets or labs. In this rare circumstance, Dr. Wassink will need documentation for all the missed classes (doctors notes, grief absence information, etc.)

GRIEF ABSENCES.

According to university policy, we will accommodate the bereavement process of a student who has lost a family member or who is experiencing emotional distress from a similar tragedy so that the student is not academically disadvantaged in their classes or other academic work (e.g. research). If you experience such a tragedy during the semester, contact the lecturer and your recitation leader as soon as possible to make necessary arrangements. You also need to notify the Associate Dean of your college, according to the policy:

…it is the responsibility of the student to: a) notify the Associate Dean or designee of their college of the need for a grief absence in a timely manner, but no later than one week from the student's initial knowledge of the situation, b) provide appropriate

verification of the grief absence as specified by the Associate Dean, and c) complete all missed work as determined in consultation with the instructor.

The Grief Policy is described in detail at: https://msu.edu/unit/ombud/classroom-policies/index.html#GriefAbsencePolicy.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES.

(from the Resource Center for Persons with Disabilities, RCPD): Michigan State University is committed to providing equal opportunity for participation in all programs, services, and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD, or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a "VISA" form. Your VISA form must be given to both Dr. Wassink and your Recitation Leader a minimum of two weeks prior to the date that the accommodations are required.

DROPS AND ADDS.

The last day to add this course is the end of the first week of classes. The last day to drop this course with a 100% refund and no grade reported is March 1. If you have either added or dropped this course, you should immediately make a copy of your amended schedule to verify that you have added or dropped this course.

POLICY ON ACADEMIC HONESTY:

The University's policy concerning academic integrity is covered in the Spartan Life booklet, under General Student Regulations. For more information about this and other academic integrity issues, please visit: https://msu.edu/~ombud/academic-integrity/student- faq.html.

The Spartan Code of Honor academic pledge:

"*As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do.*"

IMPORTANT DATES:

- Monday – 01/09/2017 – Classes Begin.
- Friday – 01/13/2017 – Online open add period for spring semester ends at 8pm.
- Monday – 01/16/2017 – Martin Luther King Day - University open, classes cancelled.
- Monday 01/16/2017 to Friday 01/20/2017 – Students go to Undergraduate office, C212 Wells Hall for Mathematics enrollment changes. (Late adds, section changes)
- Friday – 02/03/2017 – End of 100% Tuition Refund
- Wednesday – 03/01/2017 – Middle of Semester. Last day to drop a course without a grade being reported.
- Monday 03/06/2017 to Friday 03/10/2017 – Spring Break

- Friday – 04/28/2017 – Last day of classes.
- **Final Exam – Monday, May 1, 12:45pm - 2:45pm, in B117 Wells Hall**

TENTATIVE SCHEDULE OF TOPICS

Dates	Week's topics
Week 1 Jan 10, 12	**Introductory Topic: Calculating Grades and GPA** ● Calculating course grades with weighted averages ● Using Excel/Google sheets to calculate final course grades (weighted averages) by programming a combination of built-in spreadsheet formulas. ● How exactly will my grade be calculated in MTH 102? ● Answering the end-of-semester question "what do I need on the final exam to earn a 3.5 in the course?" ● What will happen to my overall GPA if I earn a 3.0 in this course? A 4.0?
Week 2 Jan 17, 19	**Module 1: Voting and Politics** **Week's topic: Voter Participation, and its relationship with the Electoral College and how it can influence poll results.** ● Proportions: people per electoral vote. ● Voter participation as viewed in absolute vs. relative measures. ● The best types of graphs to compare states' voter participation rates ● Correlation vs. causation
Week 3 Jan 24, 26	**Module 1: Voting and Politics** **Week's topic: Voting Systems** ● What are issues with a state's current voting system for president, senators, or the governor (first-past-the-post)? ● Maine proposes ranked voting for future presidential elections. What is it, and how it is an improvement over the current system? ● What are other alternatives? (Borda, Pairwise comparison) ● Arrow's Theorem ● Alternative for Congressional seats: Mixed Member Proportional Voting
Week 4 Jan 31 Feb 2	**Module 1: Voting and Politics** **Week's topic: Voting Districts & Gerrymandering** ● Continue Mixed Member Proportional Voting ● Gerrymandering, and which graph types best demonstrate it. ● Prison-based gerrymandering.
Week 5 Feb 7, 9	Review for test (Feb 7) and **Test 1** (Feb 9)
Week 6 Feb 14, 16	**Module 2: Finance and Economics** **Week's Topic: Loan Payments and financial decisions.** ● What is an APR? ● Structured vs unstructured loans. ● Loan payments – how is the payment divided between interest and principal? ● Making the minimum credit card payment. ● Linear scaling to estimate loan payments (with given amounts for $1000 loan) ● If an individual has extra money and multiple loans, which to pay off first?

	● Cash back or 0% APR when buying a new car? ● Want to drive a new car. Lease or buy?
Week 7 Feb 21, 23	**Module 2: Finance and Economics** **Week's Topic: Buying a house and financial decisions.** ● Down payment, closing costs, and mortgage insurance ● Closing costs ● Fixed rate or adjustable rate with low initial fixed rate? ● What affects APR? (credit score, Federal Reserve and Central Bank, etc) ● How much house can I afford? ● Estimating real cost of ownership (repairs, maintenance, etc.) ● Will be in graduate school for 5 years. Rent or buy a house?
Week 8 Feb 28 Mar 2	**Module 2: Finance and Economics** **Week's Topic: Savings** ● Simple vs. Compounding interest ● Exponential Growth ● Doubling time ● APY vs. APR ● Linear scaling: estimating future balance when given an APY. ● Stock market (401K, 529 plan, etc.) vs. CDs & savings accounts. ● Begin the Stock Market Game
Week 9 Mar 14, 16	**Module 2: Finance and Economics** **Week's Topic: More Financial Decisions** ● Discuss progress on the Stock Market Game ● Combine loans and savings knowledge to make advanced financial decisions.
Week 10 Mar 20, 23	Review for Test 2 (March 21), and **Test 2** (March 23)
Week 11 Mar 28, 30	**Module 2: Finance and Economics** **Week's Topics: Consumer Price Index (CPI) and Inflation** • CPI: why money stuffed under the mattress loses value. • CPI-based Unit Conversions (Convert to 2016 dollars). • Differences in line graphs with and without adjusting for inflation. • Chained CPI and the Federal Budget
Week 12 Apr 4, 6	**Module 2: Finance and Economics** **Week's Topic: Taxes and Millage Rates** • Proportions: for a given millage rate, how much would a particular family's property taxes increase? • Tax bracket vs. effective tax rate (Federal income taxes) • Calculating federal income taxes (using the standard deduction). • Address misconception that increasing tax brackets could decrease your amount of take-home pay. • Percentages: what does an individual's tax dollars pay for? How much does a particular individual pay for welfare? Military? Science and Technology? • Percentages: Federal discretionary spending vs. mandatory spending

Week 13 Apr 11, 13	**Module 2: Finance and Economics** **Week's Topic: Budgets and Debt** • Continue Percentages: what does an individual's tax dollars pay for? How much does a particular individual pay for welfare? Military? Science and Technology? • Continue Percentages: Federal discretionary spending vs. mandatory spending • US Debt – where does the money come from? What percent of debt is held by foreign governments? • Personal budgets: combine information about taxes, debt payments, savings goals, and living expenses to make a realistic post-graduation budget based on a hypothetical salary.
Week 14 Apr 18, 20	Review, catch up (April 18); **Test 3** (April 20)
Week 15 Apr 25, 27	Review for final exam
Final Exam – Monday, May 1 2017 12:45pm - 2:45pm in B117 Wells Hall	

SCHEDULE OF ASSIGNMENTS (beings on next page)

MTH 102 tentative schedule for January:

January 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	**2**	**3**	**4**	**5**	**6**	**7**
8	**9** Classes begin	**10** Lecture worksheet #1 in class.	**11**	**12** Lab 1 in class. HW1 is available on D2L.	**13** Open add ends, 8pm	**14**
15	**16** MLK day – classes canceled	**17** **HW1 due by noon on D2L.** Lecture worksheet #2 in class	**18** **Project Phase 1 due, 6am on D2L**	**19** Lab 2 in class. Project Phase 2 activity in class. HW2 is available on D2L.	**20**	**21**
22	**23**	**24** HW2 due by noon on D2L. Lecture worksheet #3 in class	**25**	**26** Lab 3 in class. HW3 is available on D2L.	**27**	**28**
29	**30**	**31** HW3 due by noon on D2L. Lecture worksheet #4 in class **Project: Task 1 of Phase 2 due!**	**Notes:** Monday 01/16/2017 to Friday 01/20/2017 – Students go to Undergraduate office, C212 Wells Hall for Mathematics enrollment changes. (Late adds, section changes)			

MTH 102 tentative schedule for February:

February 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	**2** Lab 4 in class. HW4 is available on D2L.	**3** End of 100% tuition refund	**4** **Make a formula sheet for Thursday's test!**
5	**6**	**7** HW4 due by noon on D2L.	**8** **Remember your formula sheet and calculator for tomorrow's test!**	**9** **MTH 102 Test 1** HW5 is available on D2L.	**10**	**11**
12	**13**	**14** HW5 due by noon on D2L. Lecture worksheet #5 in class	**15**	**16** Lab 5 in class. HW6 is available on D2L.	**17**	**18**
19	**20**	**21** HW6 due by noon on D2L. Lecture worksheet #6 in class **Project: Task 2 of Phase 2 due!**	**22**	**23** Lab 6 in class. HW7 is available on D2L.	**24**	**25**
26	**27**	**28** HW7 due by noon on D2L. Lecture worksheet #7 in class	**Notes:**			

MTH 102 tentative schedule for March:

March 2017

March 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Middle of semester. Last day to drop a course without a grade being reported.	**2** Lab 7 in class. HW8 is available on D2L.	**3** .	**4**
5	**6** Spring Break **Consider working on Phase 3 over break!**	**7** Spring Break	**8** Spring Break	**9** Spring Break	**10** Spring Break	**11**
12	**13**	**14** **HW8 due by noon on D2L.** Lecture worksheet #8 in class	**15**	**16** Lab 8 in class. HW9 is available on D2L.	**17**	**18** **Make a formula sheet for Thursday's test!**
19	**20**	**21** HW9 due by noon on D2L.	**22** **Remember your formula sheet and calculator for tomorrow's test!**	**23** **MTH 102 Test 2** HW10 is available on D2L.	**24**	**25**
26 !	**27**	**28** HW10 due by noon on D2L. Lecture worksheet #9 in class. .	**29**	**30** Lab 9 in class HW11 is available on D2L.	**31**	**Notes:** **Project: Phase 3 due soon!**

MTH 102 tentative schedule for April:

April 2017						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	**3**	**4** HW11 due by noon on D2L. Lecture worksheet #10 in class	**5**	**6** Lab 10 in class HW12 is available on D2L.	**7**	**8**
9	**10**	**11** HW12 due by noon on D2L. Lecture worksheet #11 in class	**12**	**13** Lab 11 in class HW13 is available on D2L.	**14** <u>**Project: Phase 3 due**</u>	**15** **Make a formula sheet for Thursday's test!**
16	**17**	**18** HW13 due by noon on D2L.	**19** **Remember your formula sheet and calculator for tomorrow's test!**	**20** **Test 3**	**21**	**22** **Finish Phase 4 and begin making 2 formula sheets for the final exam!**
23	**24**	**25** Review for final exam in class	**26** <u>**Project: Phase 4 due**</u>	**27** Review for final exam and discuss project in class	**28** Last day of classes	**29**
30	**Notes:** The MTH 102 <u>final exam</u> is Monday, May 1, 12:45 - 2:45pm in B117 Wells Hall Don't forget your calculator or formula sheets!					