ABM 203: Data Analysis for the Agri-Food System (3 credits)
Department of Agricultural, Food, and Resource Economics

Class Place and Time:

Tuesdays and Thursdays, 8:30 – 9:50 AM, S107 South Kedzie

Instructors, contact information, and office hours:

Yuyuan Che
Email: cheyuyua@msu.edu
Office hours: Tuesdays, 3:00PM-5:00 PM or
by appointment (arrange via email)
Office and office hours location:
Room #200 in Cook- Seevers Hall

TA: Tram Hoang
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Prerequisite: (ABM 100) and (EC 201 or concurrently)

Course goal:

The goal of this course is to introduce students to quantitative methods for agribusiness decision-making. Examples will be presented using Microsoft Excel. This course plays an important role by building skills for use in later ABM, FIM, and EEM courses as well as teaching important problem-solving skills for decision-making.

Strategic learning objectives (SLOs):

By completing this course, students should be able to:

1. Use Excel to summarize, aggregate, filter, sort, and clean data
2. Use formulas and functions in Excel, drawing on multiple worksheets or workbooks when necessary, to calculate revenue, costs, profits, and other values relevant for analyzing the behavior of agri-food system actors
3. Select an appropriate chart type for a given task or type of data, then construct the chart in Excel and interpret the results
4. Calculate/construct summary statistics, frequency tables, and histograms in Excel and interpret the results
5. Estimate a simple linear regression model in Excel and interpret the results
6. Use Excel to calculate the net present value (NPV) and internal rate of return (IRR) of a project or investment. Students should also be able to interpret the NPV and IRR and use the NPV to choose among alternative projects or investments.

7. Create professional reports using appropriate data analysis and visualization tools to summarize quantitative and qualitative information.

These course SLOs support students' development of competencies in the following SLO areas that have been established for ABM, FIM, and EEM majors: Analytical Thinking, Integrated Reasoning, and Effective Communication.

Required software:

1. ***Microsoft Excel 2016:*** This course will use Microsoft Excel 2016 extensively. All students are required to have access to Microsoft Excel 2016 (*** *the full version, not the Excel Online version ***). Students may install the software on their own computer/laptop or use one of MSU's computer labs. Microsoft Excel 2016 is available to all active MSU students as part of your tuition. See https://tech.msu.edu/technology/hardware-software/microsoft-licenses/ for details.

   Why Excel?
   Excel is the most commonly used data software in business and most jobs in which students will find themselves. Further, developing proficiency in the use of Excel is helpful in using other commercial software used by firms, agencies, and non-profits.

2. ***Top Hat Classroom*** *subscription (one semester or annual)*

3. ***Top Hat Test*** *subscription (one semester)*

   We will be using the Top Hat (www.tophat.com) classroom response system in this course. You will be able to submit answers to in-class polling questions and mini-quizzes using Apple or Android smartphones and tablets, laptops, or through text message.

   Visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) for information on how to register for a Top Hat account and for a brief overview to get you up and running on the system. Instructions for how to create a Top Hat account will also be included in the class notes for the first day of class. The Top Hat Course Join Code for ABM 203 is 859230**.**

Optional textbook:

There is no required textbook for this course. Students that are interested in further examples or Excel applications that will not be covered in the course might want to use the following reference book: Walkenbach, J. (2015). *Microsoft Excel 2016 bible: The comprehensive tutorial resource*. Indianapolis, IN: Wiley.

Required materials to bring to class each day:

1. A **laptop** with Excel 2016 on it (if you have a laptop)
2. At least **one device with Top Hat on it** (laptop, tablet, or smartphone)
3. **Paper**
4. **Pencil**
5. **Calculator**
6. Your **MSU ID**

Policies:

- *D2L and email:* Students are responsible for checking D2L and their MSU email accounts regularly to stay up-to-date on announcements. If you don't check your MSU email account, you should forward it to an account that you do check. Students are responsible for any information distributed via email and/or D2L. ***Please be sure to copy the instructor (cheyuyua@msu.edu) on all emails and D2L messages.***

- *Laptops:* Students with laptops should bring their laptops to all class meetings and are encouraged to engage in the Excel applications we will go through during lectures and group in-class exercises. Students without laptops will be grouped with students with laptops for in-class exercises. Note that the use of laptops in class is a privilege and not a right. Laptops are to be used for class activities only. If you are seen surfing the web, chatting, e-mailing, etc., you will lose these privileges.

- *Cell phones*: You must put away - out of sight - all cell phones - while in class – except when you are using your phone for Top Hat-related activities. Use of cell phones in any form is not allowed in this course except for Top Hat-related activities. Please put your phone on silent before entering the classroom so as not to distract others.

- *Attendance:* You cannot contribute to our learning if you are not in class. At the same time, it is understood that you may have other responsibilities and priorities. To balance these considerations, you are allowed two absences without penalty. You can use these as you wish (e.g., for job interviews, family needs, health days) with no questions asked. On these occasions, you are still responsible for turning in your assignment BEFORE the class session that you will miss. Please note that we will not make arrangements for homeworks, mini-quizzes, or other assignments after the fact. **For each absence beyond your two allowed absences, 0.4 points will be deducted from your individual participation grade**. (See below for further details on the individual participation component of your overall course grade.) In the event of illness, please bring a note from the Health Center to the next class session.

- *Punctuality:* Please be on time. You are expected to be in class from the time it starts until the time it ends. Attendance will be taken at random times during class via Top Hat. If you are not present at the time attendance is taken, you will be considered absent. Please do not leave and re-enter class.

- *Late assignments:* Late assignments are NOT allowed and will be given a grade of zero. No partial credit will be given for late assignments.

- *Suggestions:* If you have special inquiries or constructive suggestions concerning the progress of the class, please feel free to talk to or email the instructors.

Academic Honesty:

Academic dishonesty, including but not limited to plagiarism and turning in someone else's assignment as your own, will NOT be tolerated. Note that we can detect if you get a file from a classmate and save it with a new name. Such actions and other forms of academic dishonesty will not be tolerated. Failure of the course or of an assignment may result from such dishonesty. Relevant University policies will be followed in any such cases.

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 in ownership 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.*"*

Assessment:

Assessment item (see below for description)	% of final grade	Total points possible
Mini-quizzes	25	25
Homework assignments	40	40
Top Hat poll (Jan. 09)	1	1
Individual participation	9	9
Group participation	5	5
Final project	20	20
TOTAL	**100**	**100**

1. Mini-quizzes (25% of final grade, 25 points possible):
   There will be 7 mini-quizzes during the semester. Students may bring printed notes to class to use during these quizzes; otherwise, the quizzes will be closed notes/closed book. Students can earn up to 5 points on each quiz and can eliminate their lowest two quiz scores. See the "Important Dates" section below for the tentative schedule for the mini-quizzes but note that this schedule is subject to change. Mini-quizzes may be given at any time during a given class meeting (beginning, middle, or end); you must be present in class when the quiz is administered to get credit for the quiz. No make-up quizzes will be given. Many (and possibly all) of the quizzes will be administered through Top Hat.

2. Homework Assignments (40% of final grade, 40 points possible):

Students will work on 8 homework assignments during the semester. Students can get up to 5 points per homework assignment, and students can eliminate their lowest homework grade. The 7 best homework grades will be re-weighted appropriately to be out of 40 total points (e.g., $30/35 \approx 34.3/40$). No late homework assignments will be accepted. See the "Important Dates" section below for the dates when homework assignments will be distributed and due. **All homeworks are due BY THE BEGINNING OF CLASS (that is, BY 8:30 AM) ON THE DUE DATE** and should be submitted to the designated D2L Dropbox. You are to work on homeworks individually and turn in your own work.

3. Top Hat poll (1% of final grade; 1 point possible):

As an incentive for you to set up your Top Hat account and to give you some practice in Top Hat before we begin using it for mini-quizzes, a poll will be administered through Top Hat on the second day of class (Jan. 09). You must be present in class and have active Top Hat subscriptions as listed above to complete the poll. If you complete the poll, you will earn 1 point (worth 1% of your course grade).

4. Individual participation (9% of final grade, 9 points possible):

Your attendance in class will make up 9% of your course grade. See class policies above regarding attendance. Attendance will be taken every class but the time at which attendance is taken will vary from class to class. Top Hat will be used to take attendance. *** Note that you must have location services turned on on your device and for the Top Hat app to get credit for being in class.

5. Group participation (5% of final grade, 5 points possible):

We will be doing hands-on in-class exercises in Excel on most class days. You will work in groups of 3 to do these exercises; groups will be formed on the second or third day of class and at least one member of each group must bring to each class session a laptop with Excel 2016 installed on it. At the end of class, one member of your group will need to submit the group's in-class exercise to the D2L Dropbox for that day. Failure of your group to submit the in-class exercise to D2L by 11:00 PM on the day of the exercise will result in a reduction in the group participation grade for ALL members of your group. The exact points per in-class exercise will depend on the total number of in-class exercises assigned during the semester. *** Only students present in class per the attendance records will get credit for in-class exercises.

6. Final Project (20% of final grade, 20 points possible):

There is no final exam for this course; there will instead be a final project. Students will work in teams of 3 to analyze a data set. The project will require building an Excel workbook, utilizing many of the Excel tools covered in class, and writing up your interpretation of the results. Specific instructions for the final project will be distributed approximately 3 weeks prior to the due date. **THE FINAL PROJECT IS DUE BY 07:45 AM ON TUESDAY, APRIL 28** and should be submitted to the designated D2L Dropbox. No late final projects will be accepted; late projects will be given zero as a grade.

Grading scale:

4.0 = 92 to 100 points	**2.0** = 70 to 74.9 points
3.5 = 85 to 91.9 points	**1.5** = 65 to 69.9 points
3.0 = 80 to 84.9 points	**1.0** = 60 to 64.9 points
2.5 = 75 to 79.9 points	**0** = Less than 60

There will be no rounding. For example, 91.5 is 3.5 and not 4.0.

IMPORTANT DATES
(for homework assignments, mini-quizzes, and final project)

#	Date	Main topics	Assignments due/distributed	Quizzes
1	Tues., Jan. 07	Course intro, go through syllabus		
2	Thurs., Jan. 09	Intro to Excel: Getting Started		
3	Tues., Jan. 14	Basic Operations, Formulas, Functions	HW #1 distributed	
4	Thurs., Jan 16	Printing in Excel		1
5	Tues., Jan. 21	Additional functions & key operations	HW #1 due	
6	Thurs., Jan 23	Charts: Intro & Column Charts	HW #2 distributed	
7	Tues., Jan. 28	Bar Charts & Line Charts		
8	Thurs., jan.30	Line Charts (cont'd)	HW #2 due	
9	Tues., Feb. 04	Pie Charts	HW #3 distributed	
10	Thurs., Feb. 06	Scatter (XY) Charts		2
11	Tues., Feb. 11	Scatter charts (cont'd) & Stats basics (intro, mean)	HW #3 due	
12	Thurs., Feb. 13	Var/st.dev/Cov/Corr	HW #4 distributed	
13	Tues., Feb. 18	Simple linear regression		3
14	Thurs., Feb. 20	Regression (cont'd)	HW #4 due	
15	Tues., Feb. 25	Regression wrap-up	HW #5 distributed	
16	Thurs., Feb. 27	Descriptive statistics, Frequency tables & histograms, etc.		
	Tues., Mar. 03	SPRING BREAK		
	Thurs., Mar. 05	SPRING BREAK		
17	Tues., Mar. 10	Financial tools & Loan calculations	HW #5 due	
18	Thurs., Mar. 12	Cancelled (Online transition)	HW #6 distributed	4
19	Tues., Mar. 17	NPV & IRR		

#	Date	Main topics	Assignments due/distributed	Quizzes
20	Thurs., Mar. 19	Filtering, Sorting, and Aggregating	HW #6 due	5
21	Tues., Mar. 24	Conditional Formatting & IF/COUNTIF	HW #7 distributed Final project distributed	
22	Thurs., Mar. 26	SUMIF, AVERAGEIF, LOOKUP		
23	Tues., Mar. 31	VLOOKUP	HW #7 due	
24	Thurs., Apr. 02	VLOOKUP (cont'd) & intro to Pivot Tables	HW #8 distributed	6
25	Tues., Apr. 07	Pivot Tables (cont'd) & Pivot Charts		
26	Thurs., Apr. 09	Importing Data, Text-to-Columns, Find-and-Replace	HW #8 due	
27	Tues., Apr. 14	Data cleaning		7
28	Thurs., Apr. 16	What If Analysis		
29	Tues., Apr. 21	References and Citations		
30	Thurs., Apr. 23	Course wrap-up		
	Tues., Apr. 28	FINAL EXAM PERIOD (07:45 AM-09:45 PM) ** NO FINAL EXAM PLANNED – FINAL PROJECT INSTEAD (DUE TO D2L BY 07:45 AM on April 28) **		

Note: Dates for all homework assignments and mini-quizzes are <u>tentative</u>.

Course contents:

[This is a tentative list of course contents. These might change during the semester depending on progress in class and student interest. Check D2L for updates.]

1. <u>Course overview and student peer panel</u> on how they used Excel and other data analysis tools in their summer internships and jobs

2. <u>Excel Basics</u>

   - Getting started with Excel
   - Entering and formatting data
   - Editing spreadsheets
   - Autocomplete function
   - Cell referencing
   - Basic operations & entering formulas
   - Basic functions: sum, max, min, average, count, mode, median

- Printing in Excel

3. Charts

   - Types of charts and when to use them
   - Interpreting charts
   - Chart formatting best practices
   - Embedding a chart in Power Point or Word

4. Basic statistics in Excel

   - Summary statistics
   - Frequency tables and histograms
   - Variance, standard deviation, covariance, correlation, and coefficient of variation
   - Simple linear regression (and discussion of correlation vs. causation)
   - R-squared

5. Data Management

   - Filtering and sorting data
   - Outlining/aggregating data in Excel
   - Conditional formatting
   - Useful functions: IF (and nesting IFs), LOOKUP, VLOOKUP
   - Importing data into Excel (.csv and .txt files) and converting text-to-columns
   - Data cleaning and checking for outliers

6. Introduction to Financial Tools in Excel

   - Loan calculations
   - (Net) Present value
   - Internal rate of return

7. Pivot Tables and Pivot Charts

8. "What if" Analysis

   - Data Table
   - Goal Seek
   - Scenario Manager

OTHER COURSE POLICIES:

Academic Honesty: Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the (insert name of unit offering course) adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu.) Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the www.allmsu.com Web site to complete any course work in this course. Students who violate MSU academic integrity rules may receive a penalty grade, including a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work. (See also the MSU Academic Integrity webpage.)

Limits to confidentiality. Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues to protect the health and safety of MSU community members and others. As the instructors, we must report the following information to other University offices (including the Department of Police and Public Safety) if you share it with one of us:
--Suspected child abuse/neglect, even if this maltreatment happened when you were a child,
--Allegations of sexual assault or sexual harassment when they involve MSU students, faculty, or staff, and
--Credible threats of harm to oneself or to others.
These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting you are encouraged to make an appointment with the MSU Counseling Center.

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 Verified Individual Services Accommodation ("VISA") form. Please present this form to Dr. Mason at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored.

Commercialized Lecture Notes: Commercialization of lecture notes and university-provided course materials is not permitted in this course.

Disruptive Behavior: Article 2.III.B.4 of the Academic Freedom Report (AFR) for students at Michigan State University states: "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.III.B.10 of the AFR states that "The student has a right to scholarly relationships with faculty based on mutual trust and civility." General Student Regulation 5.02 states: "No student shall . . . interfere with the functions and services of the University (for example, but not limited to, classes . . .) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action through the Student Judicial Affairs office.

Course Attendance: Students whose names do not appear on the official class list for this course may not attend this class. Students who fail to attend the first four class sessions or class by the fifth day of the semester, whichever occurs first, may be dropped from the course.

Emergency Preparedness: In the event of an emergency arising within the classroom, the instructor(s) will notify you of what actions may be required to ensure your safety. It is the responsibility of each student to understand the evacuation, "shelter-in-place," and "secure-in-place" guidelines posted in each facility and to act in a safe manner. You are allowed to maintain cellular devices in silent mode during this course, in order to receive emergency SMS texts, phone or email messages distributed by the university. When anyone receives such a notification or observes an emergency situation, they should immediately bring it to the attention of the instructor(s) in a way that causes the least disruption. If an evacuation is ordered, please ensure that you do it in a safe manner and facilitate those around you that may not otherwise be able to safely leave. When these orders are given, you do have the right as a member of this community to follow that order. Also, if a shelter-in-place or secure-in-place is ordered, please seek areas of refuge that are safe depending on the emergency encountered and provide assistance if it is advisable to do so.