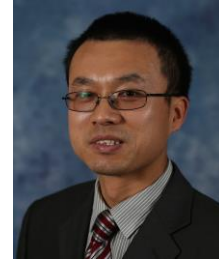# Optimization and Management of Food and Agricultural Systems
Syllabus – Spring 2020
Online course

Course number: F_S/AG_S_M 4390 / 7390 (3 credits)
Instructor: Jianfeng Zhou, PhD, Assistant Professor
Agricultural Systems Management
573-882-2495 (office phone)
zhoujianf@missouri.edu
211 Agricultural Engineering Building, Columbia, MO

Delivery Mode: The course will be delivered **100% online** and all sessions will be asynchronous. Modules will be opened sequentially to help students follow the course, complete discussions and assignments in an orderly fashion. Announcements will be posted every week. Please post your comments in discussion board and complete assignments on set due dates.

Office Hours: All queries from participants will be answered by email promptly within 24 hours (except on weekends). If you are an on-campus student, you are welcome to stop by and discuss with me, after scheduling a time by sending an email. If you are a distance student, you are welcome to call 573-882-2495 after scheduling an appointment by email.

Course description: There are many solutions to a given problem, but selecting the solution with the lowest annual cost would be the most desirable one. Modeling, linear programming and search optimization techniques along with spreadsheets allow us to examine alternative solutions for a problem. This course will introduce the key ideas of modeling and optimization of systems, and methods of management decision-making using Solver™ and MS-Excel™.

Course Learning Objectives: Upon completion of this course, the students should be able to:
1. Identify the systems related to food and agricultural systems.
2. Construct a model by studying the environment and identifying the inputs, processes and outputs of a system.
3. Learn and apply the optimization methods to various problems in food and agricultural systems.
4. Develop models and apply linear, integer and nonlinear optimization techniques to generate solutions.
5. Use Solver™, MS-Excel™ and software tools for linear and non-linear optimization.
6. Understand and interpret the results of the solutions.

Expectations: Every week, you are expected to log into the course site no fewer than twice. Each week of the course will have a corresponding instructional unit which includes your assigned reading, lecture videos, instructor summary, and weekly discussion questions. You should complete your readings and review of the course commentary before posting answers/reflections to the discussion questions. In addition to posting your own original thoughts addressing the discussion question **by the due dates listed** for each discussion board, you should also thoughtfully comment or reflect on at least one other student's postings before the discussion board is closed.
　　　　Due dates for assignments are posted and should also be completed on time. You must notify me in advance if you anticipate being unable to complete a discussion forum or assignment on time because of a valid reason beyond your control and seek approval to submit work late. Without prior approval, late work will not be accepted.

Course web page: MU Canvas: https://courses.missouri.edu/.

Textbook: (1) An introduction to management science: Quantitative approaches to decision making, 14th Edition by *David R. Anderson, etc.*;
(2) Decision Modeling with Microsoft Excel, 6th Edition *by Moore and Weatherford.*

Grading and Assignments:

98 – 100 = A+	87 – 89 = B+	77 – 79 = C+	67 – 69 = D+
93 – 97 = A	84 – 86 = B	73 – 76 = C	63 – 66 = D
90 – 92 = A-	80 – 83 = B-	70 – 72 = C-	60 – 62 = D-

Exam 1	15%
Exam 2	15%
Exam 3	15%
Homework/assignments	40%
Course project*	10%
Participation	5%

* The course project should design an optimization and management system based on a problem you are familiar (can be a real problem in your work or intern, or an imaginary system with sufficient complex). The outcomes of the course project include a proposal (due at the 8th week, 30%), a 10-15 min presentation (due on 15th week, 30%) and a report (due at the end of the semester, 40%).

An additional assignment as part of course project is required for graduate students, who need present one of the papers provided or you select. A one-page summary and 10-15 min presentation is due on week 15 or 16. Your presentation will be judged by other students and the instructor. The score will base on the presentation (50%) and the summary (50%). If you would like to work on other project, a prior agreement with the instructor is required.

Late and resubmission

Assignments are expected to be submitted no later than due time. A reduction of 5% of earned points will be taken each day after due time. Assignments may be resubmitted once (1 time) with a revision within a week from the time return of homework. The final point of each assignment will equal to 20%*(points of original submission) + 80%*(points of resubmission). Any excuse should be announced in advance.

CAFNR Student Development Plan

The CAFNR Student Development Plan is a tool designed to help you track your progress in academic success and career readiness. Always remember that CAFNR faculty and staff are here to help you along the *way*! Contact us for assistance. Follow the website to learn more.
https://appsprod.missouri.edu/StudentPlan/

Academic honesty policy:

Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor.

Policy Related To Students With Disabilities - Americans with Disabilities Act:

If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, please let me know as soon as possible.

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please register with the Office of Disability Services (http://disabilityservices.missouri.edu), S5 Memorial Union, 882-4696, and then notify me of your eligibility for reasonable accommodations. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage.

Intellectual Pluralism:

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the Departmental Chair or Divisional Director; the Director of the *Office of Students Rights and Responsibilities* (http://osrr.missouri.edu/); or the *MU Equity Office* (http://equity.missouri.edu/), or by email at equity@missouri.edu. All students will have the opportunity to submit an anonymous evaluation of the instructor(s) at the end of the course.

Executive Order #38, Academic Inquiry, Course Discussion and Privacy:

University of Missouri System Executive Order No. 38 lays out principles regarding the sanctity of classroom discussions at the university. The policy is described fully in Section 200.015 of the Collected Rules and Regulations. In this class, students may not make audio or video recordings of course activity, except students permitted to record as an accommodation under Section 240.040 of the Collected Rules. All other students who record and/or distribute audio or video recordings of class activity are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

Those students who are permitted to record are not permitted to redistribute audio or video recordings of statements or comments from the course to individuals who are not students in the course without the express permission of the faculty member and of any students who are recorded. Students found to have violated this policy are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

Tentative lecture schedule:

Week	Topics	Assignment
Week 1	Course overview, concept and definition of terms	
Week 2	Excel spreadsheet introduction Calculation and modeling with Excel	
Week 3	Linear Programming – Model development	
Week 4	Linear Programming – Graphical solution	
Week 5	Linear Programming – Computer solution	Exam 1
Week 6	LP output interpretation LP Applications	
Week 7	LP Applications	
Week 8	LP network models	
Week 9	Distribution and network models	Exam 2
Spring Break		
Week 11	Integer LP	
Week 12	Integer LP	
Week 13	Non-linear programming	
Week 14	Block chain and IoT in management	
Week 15	Project scheduling; course project presentation	
Week 16	Course project presentation	Exam 3
Finals	No class	

Note: Schedule is subject to change