**Agribusiness Analysis and Forecasting**
**Agricultural Economics 622**
**Spring 2020**
**Dr. Bruce McCarl and Dr. Henry Bryant**
**Tuesday / Thursday 11:10 - 12:25 p.m. (AGLS 111 B&C)**
**Wednesday 6:15 - 7:45 pm (optional help session - AGLS 111 B&C)**

The purpose of AGEC 622 is to teach Agricultural Economics graduate students the fundamentals of linear programming, forecasting, and simulation. The course material will be presented in two lectures each week.

The **first 7 weeks** will be devoted to the fundamentals of linear programming (LP). Dr. Chengcheng Fei will teach this section of the course. She will teach you how to construct, solve, and interpret different types of linear programming models using Excel. The grade of LP part will be 50% of your final grade. One help session (lab) is scheduled each week in AGLS 111 B&C to reinforce the materials presented in class and to help students with homework problems. The lab is not required but history shows students who do not attend lab get low grade in LP part. The homework in the LP part will be due on Thursday before class time and will be equal weighted. Late assignments will be penalized one letter grade per class period (in the absence of a decent excuse).

The remainder of the course will be taught using a "flipped" approach. You will be responsible for watching lecture videos **before** each class meeting, and during class times you will work exercises with the benefit of immediate help and feedback. Attendance for weeks 8 through 15 of the course is mandatory. Each student is allowed one no-questions-asked absence for weeks 8 through 15. Beyond one absence, medical documentation or an official university absence is required to avoid losing credit.

W**eeks 8 through 10** will focus on different quantitative techniques for forecasting economic data. Emphasis will be on developing forecasts for making better economic decisions in a business context. An Excel Add-In, named Simetar© will be used for this section of the course. Simetar© is available on the computers in the Department's graduate lab and all Open Access computers. Also, Simetar© download instructions will be given to you in class so you may load it on your personal and work computers. Simetar© is available free to students enrolled at TAMU.

W**eeks 11 through 15** of the semester are devoted to the fundamentals of risk analysis and decision analysis using simulation. Emphasis is on constructing, validating, and using stochastic simulation models to incorporate risk into business decision making. The Simetar© Add-In will be used extensively for this section of the course.

| | | |
|---|---|---|
| Grade Calculation: | LP Homework | 15% |
| | LP Exam | 30% |
| | LP Instructor | 5% |
| | F&S Attendance & Participation | 15% |
| | F&S Exercises | 15% |
| | Forecasting Exam | 10% |
| | Simulation Exam | 10% |

## Note: Exam scores may be normalized if necessary.
## All exercises must be handed in to be eligible to take the final exam.

Make-up exams will be given only for students with University approved excuses. **The final exam is April 30th from 3:00 - 5:00 pm.**

**The prerequisite for this course is AGEC 621 or an equivalent regression statistics course. A good understanding of Microsoft Excel is highly recommended. If you are not good to excellent in using Excel you will have a difficult time in the course.**

**Instructor Information:**


Name: Henry Bryant
Email: henry@tamu.edu
Location: RM 351E AGLS
Phone: 979-845-5913
Office hours: Tuesday and Thursday 9:30-11:00 am

Name: Chengcheng Fei
Email: feiccheng@tamu.edu
Location: RM 375 AGLS
Office hours: Monday 3:00-5:00 pm or by appointment


**Teaching Assistant:**


Name: Bingru Sheng
Email: icebingo920@email.tamu.edu
Location: 385 AGLS
Office hours: Tuesday 1:00 – 3:00 pm

Name: Brian Herbst (F&S part)
Email: herbst@tamu.edu
Location: 355 AGLS
Phone: Monday and Wednesday 10:00 am to noon

Name: Xiaoyang (Lisa) Deng (LP part)
Email: xiaoyangdenglisa@email.tamu.edu
Location: 381 AGLS
Office hours: TBD


**Suggested References and Textbooks**


Man-Keun Kim , Bruce A. McCarl, and Thomas H. Spreen, Applied Mathematical Programming http://agecon2.tamu.edu/people/faculty/mccarl-bruce/mccspr/Kim%20McCarl%20Spreen%20(2018)%20Applied%20Mathematical%20Programming.pdf

Richardson, J.W. Simulation for Applied Risk Management. Department of Agricultural Economics, Texas A&M University, 2010.

## A few words from Texas A&M

### Aggie Code of Honor

An Aggie does not lie, cheat, or steal or tolerate those who do.

The Aggie Code of Honor is an effort to unify the aims of all Texas A&M men and women toward a high code of ethics and personal dignity. For most, living under this code will be no problem, as it asks nothing of a person that is beyond reason. It only calls for honesty and integrity, characteristics that Aggies have always exemplified.

The Aggie Code of Honor functions as a symbol to all Aggies, promoting understanding and loyalty to truth and confidence in each other. For more information visit http://www.tamu.edu/aggiehonor.

### ADA Policy Statement

**Americans with Disabilities Act:** Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit **http://disability.tamu.edu**. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

### Copyright Statement

Please note that all handouts and supplements used in this course are copyrighted. This includes all materials generated for this class, including but not limited to syllabi, exams, in-class materials, review sheets, and lecture outlines. Materials may be downloaded or photocopied for personal use only, and may not be given or sold to other individuals.

### Scholastic Dishonesty Statement

As commonly defined, plagiarism consists of passing off as one's own ideas, work, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

**AGEC 622 - Spring 2020**
**Tuesday / Thursday 11:10 - 12:25 p.m. (AGLS 111 B & C)**
**Wednesday 6:15 - 7:45 pm (optional help session - AGLS 111 B & C)**

| Sun | Mon | Tuesday | Wednesday | Thursday | Fri | Sat |
|---|---|---|---|---|---|---|
| 12 | 13 | 14<br>**1st Day of Classes**<br>1. Course Intro and Basic OP | 15 | 16<br>2.Basic LP Formulation | 17 | 18 |
| 19 | 20<br>**Holiday** | 21<br>3.Formulating an LP Problem | 22<br>Lab1.Putting LP Problems into Excel | 23<br>4.Common Problems: Transport and Feed<br>**LP Homework 1** | 24 | 25 |
| 26 | 27 | 28<br>5. Joint and Assembly I | 29<br>Lab2. Class Review and Excel Exercise | 30<br>6. Assembly II and Disassembly<br>**LP Homework 2** | 31 | Feb. 1 |
| 2 | 3 | 4<br>7. Risk Modeling | 5<br>Lab3. Class Review and Excel Exercise | 6<br>8. Mixed Integer Programming<br>**LP Homework 3** | 7 | 8 |
| 9 | 10 | 11<br>9. Inventory and Storage | 12<br>Lab4. Class Review and Excel Exercise | 13<br>10. Gluing Models<br>**LP Homework 4** | 14 | 15 |
| 16 | 17 | 18<br>11. Facility Location Selection | 19<br>Lab5. Class Review and Excel Exercise | 20<br>12. LP Application in Real World<br>**LP Homework 5** | 21 | 22 |
| 23 | 24 | 25<br>13. Exam Review | 26<br>Lab6. Exam Review | 27<br>**Math Programming Exam** | 28 | 29 |
| March 1 | 2 | 3<br>Overview of Forecasting and Simulation | 4 | 5<br>Structural Models | 6 | 7 |
| 8 | 9<br>**Spring Break** | 10<br>**Spring Break** | 11<br>**Spring Break** | 12<br>**Spring Break** | 13<br>**Spring Break** | 14 |
| 15 | 16 | 17<br>Seasonality and Cycles | 18 | 19<br>Time Series Forecasting I | 20 | 21 |
| 22 | 23 | 24<br>Time Series Forecasting II | 25 | 26<br>**Forecasting Exam** | 27 | 28 |
| 29 | **30** | 31<br>Simulation Basics | April 1 | 2<br>Univariate Probability Distributions | 3 | 4 |
| 5 | 6 | 7<br>Parameter Fitting and Uncertainty | 8 | 9<br>Multivariate Probability Distributions | 10 | 11 |
| 12 | 13 | 14<br>Scenarios and Ranking Risky Alternatives | 15 | 16<br>Stochastic Processes | 17 | 18 |
| 19 | 20 | 21<br>Value-at-risk and Insurance | 22 | 23<br>Financial and Real Options | 24 | 25 |
| 26 | 27 | 28<br>**No Class** | **29** | 30<br>**Simulation Exam 3 – 5 pm** | **May1** | 2 |

**Agribusiness Analysis and Forecasting**
**Agricultural Economics 620, Spring 2020**
**Syllabus Revisions**

- By University decree, classes are cancelled for the week of March 16-20, and must be delivered online only following March 20. All information that follows pertains to this post-March 20 portion of the class.
- The revised due date for the 02_exercises is the close of business Monday, March 23.
- Lecture videos and pdfs will continue to be posted on the class website at https://www.afpc.tamu.edu/courses/622/
- The schedule of lecture topics and exam dates have been revised. A revised calendar follows on the next page.
- Exam delivery method is yet to be determined. The delivery methods for the forecasting exam on April 2 and the final exam on April 30 may differ, and each will be determined as conditions evolve.
- Office hours and class meetings will continue at the previously scheduled tines, and will be held online via the University's Zoom service. You will receive emails inviting you to these online meetings. Attendance at class meetings is still expected.
- Some preparation on your computer is needed before for your first Zoom meeting, so you should this set up in advance. A new video is on the class website with some guidance for getting started smoothly: https://www.afpc.tamu.edu/courses/622/2020/resources/00_zoom_setup.mp4
- Guidelines for Zoom class meetings:
    - **Do not share your screen unless I ask you to**
    - Use the "raise hand" feature if you would like help. When it is time for me to help you, I will then ask you to share your screen
    - I may request that you allow me to control you screen in order to help you more efficiently. A dialog box will appear on your screen requesting this permission.
    - We *may* try using the "breakout sessions" feature within Zoom to allow Mr. Herbst to help someone separately from the main session. We will not try this on the first Zoom class session, however.
- Guidelines for Zoom office meetings:
    - Mr. Herbst and I will use the "waiting room" feature of Zoom in order to help one person at a time. If one or more people are in front of you, you will need to wait for your turn to visit.
    - If you want to visit jointly with one or two of your fellow students, let us know and we can let all of you "in" to the office hours meeting at the same time.
    - You sharing your screen and allowing control of your screen will work the same as in the class sessions.

**AGEC 622 - Spring 2020 Revised Calendar**
**Tuesday / Thursday 11:10 - 12:25 p.m. (online delivery after March 20)**

| Sun | Mon | Tuesday | Wednesday | Thursday | Fri | Sat |
|---|---|---|---|---|---|---|
| 12 | 13 | 14<br>**1st Day of Classes**<br>1. Course Intro and Basic OP | 15 | 16<br>2.Basic LP Formulation | 17 | 18 |
| 19 | 20<br>**Holiday** | 21<br>3.Formulating an LP Problem | 22<br>Lab1.Putting LP Problems into Excel | 23<br>4.Common Problems: Transport and Feed<br>**LP Homework 1** | 24 | 25 |
| 26 | 27 | 28<br>5. Joint and Assembly I | 29<br>Lab2. Class Review and Excel Exercise | 30<br>6. Assembly II and Disassembly<br>**LP Homework 2** | 31 | Feb. 1 |
| 2 | 3 | 4<br>7. Risk Modeling | 5<br>Lab3. Class Review and Excel Exercise | 6<br>8. Mixed Integer Programming<br>**LP Homework 3** | 7 | 8 |
| 9 | 10 | 11<br>9. Inventory and Storage | 12<br>Lab4. Class Review and Excel Exercise | 13<br>10. Gluing Models<br>**LP Homework 4** | 14 | 15 |
| 16 | 17 | 18<br>11. Facility Location Selection | 19<br>Lab5. Class Review and Excel Exercise | 20<br>12. LP Application in Real World<br>**LP Homework 5** | 21 | 22 |
| 23 | 24 | 25<br>13. Exam Review | 26<br>Lab6. Exam Review | 27<br>**Math Programming Exam** | 28 | 29 |
| March 1 | 2 | 3<br>01 Overview of Forecasting and Simulation | 4 | 5<br>02 Structural Models | 6 | 7 |
| 8 | 9<br>**Spring Break** | 10<br>**Spring Break** | 11<br>**Spring Break** | 12<br>**Spring Break** | 13<br>**Spring Break** | 14 |
| 15 | 16<br>**Classes Cancelled** | 17<br>**Classes Cancelled** | 18<br>**Classes Cancelled** | 19<br>**Classes Cancelled** | 20<br>**Classes Cancelled** | 21 |
| 22 | 23 | 24<br>03 Seasonality and Cycles | 25 | 26<br>04 Time Series Forecasting I | 27 | 28 |
| 29 | **30** | 31<br>05 Time Series Forecasting II | April 1 | 2<br>**Forecasting Exam** | 3 | 4 |
| 5 | 6 | 7<br>06 Simulation Basics | 8 | 9<br>07 Univariate Probability Distributions | 10 | 11 |
| 12 | 13 | 14<br>08 Parameter Fitting and Uncertainty | 15 | 16<br>09 Multivariate Probability Distributions | 17 | 18 |
| 19 | 20 | 21<br>10 Scenarios and Ranking Risky Alternatives | 22 | 23<br>11 Stochastic Processes, Value-at-risk, options | 24 | 25 |
| 26 | 27 | 28<br>**No Class** | **29** | 30<br>**Simulation Exam 3 – 5 pm** | **May1** | 2 |