CLASS CONDUCT

The lectures and laboratory sections of this course are provided as part of an International Training Program entitled “Assessing Crop Production, Water and Nutrient Management, Climatic Risk and Environmental Sustainability” held at the University of Georgia – Griffin Campus in Griffin, Georgia from May 20 - 25, 2019. This International Training Program is a 6-day intensive workshop in which lectures and hands-on exercises on modeling and DSSAT are alternated. The DSSAT workshop provides students with the opportunity to interact with many international scientists, participate in discussions, and develop a scientific network.

Resource material include the book “Understanding Options for Agricultural Production,” which will be provided to the students, and the PowerPoint files of the lectures, which will be placed on the workshop website to download. In addition to the lectures and discussions with instructors, students are required to complete homework exercises and submit them for grading. The first 6 exercises will be submitted within two weeks after the end of the DSSAT workshop, while the remainder will be submitted approximately one month after the workshop. The exercises will count 40% of the final grade. The exercises should be written up in a typed report style that somewhat mimics a paper, to include what you did for the exercise (the “methods”), the results/outcome (either tables or “cut-and-paste” graphics examples) that answer the questions posed in the exercise, and interpretation by you.

COURSE MATERIALS

The following course material is required:

- DSSAT v4.7. This software is free and is available from the DSSAT Foundation (www.DSSAT.net). Students will be provided with the software during the DSSAT course. The DSSAT software is licensed and you will have a license that will continue after the course.
- A text book that describes the models and applications, Tsuji et al., Understanding Options for Agricultural Development. The book is part of the registration for the DSSAT course and a copy will be provided to each student.
- Each student is expected to provide his/her own computer, preferably a notebook that can be used during the workshop and be brought to the discussion periods.
FINAL EXAM

We will administer a one-hour exam during early July, based on the material covered in the lectures, discussions, and selected chapters of the text book. The exam will count 20% of the final grade.

SPECIAL PROJECT

Each student will select a topic for a course project and use DSSAT models/software for analyzing a particular system. This project will count 40% of the grade. In the first class meeting during early June, you will present plans for the project in a 1-2 page submission and obtain feedback from the instructors. Students will present their special projects on an agreed-upon date during late July using video conferencing or Skype if necessary for distant students, with the final written report due in **late July one week after the presentation.**

CLASS SCHEDULE

- **May 20-25** All-day meetings, attend DSSAT course lectures, begin homework assignments
- **May 31** Deadline for 1-page special project description
- **TBA** First 6 homework exercises are due
- **TBA** Meet to discuss first homework exercises and special project
- **TBA** Remainder of homework exercises due
- **TBA** Meet to discuss remainder of homework exercises & review for final exam
- **TBA** Final Exam
- **TBA** Draft Special Project Report due
- **TBA** PowerPoint presentations of Special Project
- **TBA** 10 minutes presentation & 5 minutes for questions
- **TBA** Final submission of Special Project Report

Possible Topics for Special Projects: Using crop models to….

1. Use your own data to adapt a model and then apply the model for an analysis (such as a comparison of management options, climate risks, soil nutrients, irrigation, etc.
2. Evaluate physiological traits to improve genetic yield potential or crop adaptation to particular environments.
3. Evaluate crop model response to climatic factors by comparison to published data.
4. Study carbon sequestration relative to crops and management practices.
5. Study benefits of crop rotation to subsequent crops (only N and water effects will work) under particular weather conditions.
6. Evaluate best management practices (BMPs) to minimize nitrate leaching or irrigation water use.
7. Evaluate crop management (water, N, cultural practices, etc.) to maximize crop yield or net profit.
8. Evaluate weather risks to production (yield and net profit) for various world sites (soils and weather).

9. Linkage of crop models with GIS for spatial analysis of yield variability.

10. Use of a model in DSSAT CSM to quantify yield losses to different factors that occur in a particular experiment (yield gap analysis).

11. Modify sections of the CROPGRO or CERES code to accomplish something new or improve crop model performance. Example could be improving prediction of ET. Improving root growth algorithms.

12. Using the model in an optimization mode to solve for crop or genetic traits.

Example of what your written paper should look like, regardless of topic:
The paper should have 8-10 pages of text (double-spaced). This page number recommendation is in addition to what will probably be many pages used for appropriate visuals (figures, tables, etc.) to document what you did for the crop modeling exercise. Structure the paper like a scientific paper, including the introduction/problem/objectives, methods and materials, results and discussion, and references. The instructors will be available and pleased to give feedback on topics, progress in the project, and in the approach for writing the project paper.