Basic to Advanced GAMS Modeling
Frisco Colorado, Aug 7 - Aug 11, 2017

This is an offering of five day bridged Basic to Advanced GAMS class. This will be a GAMS class designed for users initially who know little about GAMS or in need of a refresher who wish to improve their skills in terms of GAMS model setup, usage and debugging. It will cover many topics- see the outline for details.

Contents

Next course:

- Frisco, Colorado – Aug 7 (8 am) – Aug 11 (3pm), 2017 (5 days -- Monday - Friday)

For more information select any one of the following topics:

- Instructor
- What Will You Learn By Taking the Course?

Introduction to the Instructor

Bruce A. McCarl is a University Distinguished Professor and a Regents Professor at Texas A&M University in College Station Texas specializing in Mathematical Programming applications in Agricultural Economics. He has wide teaching, research, consulting and applied analysis experience in the application of mathematical programming and GAMS to industry, and government. (Read about some projects he has done). He wrote the Expanded Users Guide distributed with GAMS

He has been on the Texas A&M faculty since 1985 and previously taught at Oregon State University, Purdue University and Pennsylvania State University. Dr. McCarl is a winner of awards from USDA, and USEPA for his optimization applications. He was part of the IPCC group that was awarded the Nobel Peace Prize. His is Associate Editor of Climatic Change. He was Editor of Choices and Associate Editor of Water Resources Research and the American Journal of Agricultural Economics. Dr. McCarl earned a B.A. in Business Statistics from the University of Colorado and a Ph.D. in Management Science from the Pennsylvania State University.

Dr. McCarl taught his first GAMS short course in 1986 and has been a GAMS user since 1985. He has written the GAMSCHK modeling assistance product and the Expanded User Guide which is being freely distributed with releases of GAMS. He has consulted on optimization and GAMS use with employees of First National Bank of Maryland, Tasmanian Hydropower, Neodyme, USCOE, American Express, USAID, Government of Egypt, International Harvester, World Bank, Department of Energy, Bonneville Power, Electric Power Research Institute, USDA, and USEPA among others.

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What will the course help you learn?

You will learn both basic and advanced techniques for better using the professional's choice in modeling software -- GAMS. The 5-day course will provide you with learning experiences regarding the following questions:

- Do you find it desirable to do a model on how the firm might act given changes in prices, programs, policies, regulations or environmental forces? Learn how to model business and agricultural entities and reflect the influence of such forces on production processes and markets.
- Do you find yourself needing to model reaction to risk and wish to incorporate risk aversion? Learn techniques for modeling risk avoiding behavior in situations where decision makers can or cannot exercise recourse in adjusting their decisions
- Do you find yourself working on indivisible investments? Learn integer programming modeling and techniques for getting the problems to solve.
- Do you want to put a CGE model into MCP format but are unsure how to do it? Learn basic CGE modeling and MCP specification.
- When modeling does it take you a long time to construct, verify, use the model for comparative studies and convert output into meaningful reports? Learn techniques which increase the efficiency with which you use GAMS.
- Do you find yourself curious about how others model large problems? See the way a several complete modeling systems are implemented and receive a copy for your later examination
- Have you ever had a model which was infeasible, unbounded or worse yet optimal but nonsensical? Learn approaches that reveal where problems are in models so you can fix them.
- Does it take you a long time to construct, verify, use for comparative studies and convert output into meaningful reports? Learn techniques which increase the efficiency with which you use GAMS.
- Do you have a GAMS implementation that takes a long time to compute, generate or solve? Learn ways to find out the cause of extensive solution time and ways that have, in cases, reduced execution times by an order of magnitude or more.
- Have you ever talked to an experienced modeler and found out there are powerful things GAMS can do that you don't know about because of hidden features or a lack of treatment in the documentation? Learn a number of such features.
- Have you heard about GAMSIDE, GAMSCHK and wonder how they work? Learn about them from the developer of GAMSCHK who has used and taught the IDE since early 1998.
- Did you know GAMS has features that can cause you to find variable values for variables you have eliminated or that allow you to alter your data without any reaction from the model. Learn to protect yourself against these difficulties.
- Do you find yourself modeling large problems? Learn techniques to facilitate your and others understanding, documentation, ease of use and level of comfort with such models.
- Do you want to link GAMS to a spreadsheet either just using and returning data or doing a more interactive approach? Or do you even want to run GAMS in the background in a manner transparent to the user? Learn techniques to allow this.

Brief Course Description

Topics covered

- Basic GAMS modeling and use of the IDE
- Building firm models with GAMS
- Small to large Modeling strategies
- Adding risk considerations to the firm model with and without recourse
- Modeling transportation of goods and adding price responsive considerations to the model to examine pricing or sectoral policy
- Developing a basic CGE model and specifying as an MCP
- Implementing an impact analysis system
- Handling investment indivisibilities
- Solving Integer programs
- Intermixed treatment on GAMS usage including
    - Using conditionals
    - How to do efficiently verify model structure and debug flaws
    - The latest features in new GAMS releases
    - Fixing models which misbehave
    - Using macros
    - Using GAMSCHK
    - Using GAMSIDE
    - Increasing the efficiency with which you use GAMS
    - Reducing computer time and memory requirements
    - Enhancing the usefulness of GAMS output
    - Links with spreadsheets and other programs
    - Things you may not know GAMS can do - tips
    - Using an advanced basis

See a more detailed outline

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Assumed Background and Motivation of Participants

The course will be instructed assuming those present wish to do impact analyses using GAMS but initially are not very familiar with the GAMS language. It will then build to advanced topics. Participants should wish to receive practical instruction on topics that will enable them to easily do impact analyses and increase the efficiency and accuracy with which they use GAMS in modeling settings.

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Course Objectives

- To teach workshop participants techniques allowing them to
    - Learn to use GAMS
    - Conduct impact analyses
    - Incorporate risk into models
    - Handle Investment analysis
    - Use GAMS efficiently.
    - Better diagnose causes of improperly solving models
    - Enhance computer and human efficiency when using GAMS particularly when dealing with large models
    - Enhance the usefulness of GAMS output.
    - Use undocumented and or new GAMS features.
    - Teach users how to use GAMSCHK, GAMSIDE and the GAMS library builder
- To carry out this instruction in a practical GAMS application setting exposing students to a variety of modeling issues and techniques

Course Presentation Method

The class will mix hands on computing sessions with computer based lectures. The hands on sessions will involve participants working in groups of 2-3 throughout the workshop. The groups will be provided with PCs loaded with the latest available GAMS versions and all class examples. Participants can bring their own laptops capable of having 20 or so megabytes of software loaded on them from a CD-ROM also access to either a floppy or capability to take files from a USB 2.0 removable pen drive). During the hands on sessions the instructor will interact with the groups on class topics, questions and general GAMS usage. Laptops may be required depending on location as covered in the registration page.

By taking this course you will

- Receive advanced training on the topics above
- Be exposed to others attending the class learning about their GAMS usage
- Interact with the instructor who is a very experienced GAMS modeler
- Be trained in the use of software and receive copies for your use of

GAMSCHK	analyzes GAMS models and assists in their use
PUT_TOEXCEL.gms, PUT_TOHTML.gms	Code that allows greater control of output ordering plus sending of sets or parameters to either an HTML file or EXCEL.
GAMS-IDE	PC editing, execution and debugging environment
Current GAMS	The latest GAMS release

- Receive manuals on GAMS usage, and class notes including

  So Your GAMS Model Didn't Work Right A Guide to Model Repair by McCarl and Meeraus

  Expanded GAMS Users Guide – the latest update

  McCarl's GAMSCHK, REFREADER, PUT_TOHTML, PUT_TOEXCEL, and GNUPLTXY write-ups

  The latest Solver Manuals from GAMS

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Things to Do Before the Class

The class will be conducted using PCs, Students will have available an Editor which resides in the GAMS-IDE integrated development environment. Students wishing to use other editors or their own laptops should feel free to bring such. Note course software will be distributed on CD-ROM.

Students wishing to do reading before the class can download (using the Adobe pdf Reader)

the GAMSCHK writeup

- o Advanced GAMS usage tips
- o A paper using GAMSCHK
- o Notes on use of the GAMSIDE
- o The course setup and schedule

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Course History and past Participants

This course has been previously since 1998 at least twice a year. In addition courses with much of the material herein has been taught by Dr. McCarl at Texas A&M, Oregon State and Purdue for over 25 years. Prior participants in this training who have used concepts in their jobs

include individuals employed in the insurance, banking, agricultural, telecommunications, government and energy arenas.

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Need More Information?

Additional course and related material is available in the web pages linked to this one giving the

- Detailed Course Outline
- List of instructor projects
- GAMSCHK description
- The course setup and schedule
- See a sample of basic course notes
- See a sample of more advanced course notes

Related material is on

- McCarl's home page
- the GAMS home page

Other questions may be addressed by email to
brucemccarl@gmail.com or courses@gams.com
or to

Bruce McCarl
2100 Fawn Court
College Station, TX, 77845
979-693-5694(phone) 979-204-6023
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Course Site and time Schedule

Frisco is a town located in Summit County amidst the Rocky Mountains and bordering Lake Dillon is conveniently off of I-70 and only 80 Miles West of Denver at 9000 feet or 3000 meters. For more see http://www.discovercolorado.com/Summit_County_Colorado/

Location Frisco course:
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Baymont Inn & Suites Lake Dillon
1202 Summit Blvd, Frisco, CO 80443 US
I-70 Exit 203
PO Box 552
Frisco, Colorado 80443
United States
Reservations: 970 668 5094 or 844 480 8578

Summit County-Frisco, Colorado
http://lakedillonlodge.com/

Daily Schedule:
Check-in on the first day: 8:00 - 8:15 a.m.
Morning classes: 8:00 a.m. - 12:00 noon
Afternoon classes: 1:30 - 5:30 p.m.

Meals, Accommodations, and Travel

Refreshments will be available starting at 8:00 am and throughout the day, but other meals, accommodations, and travel are not included in the fee. Participants are responsible for making their own arrangements.

The Baymont Inn has a block of rooms at a reduced cost. When making reservations identify yourself as a participant in the GAMS Computer Modeling Course. You will need to call the hotel directly in order to receive the group rates at the numbers given above. Other hotels are available in the area including a Holiday Inn, and a Ramada very nearby. The visitors bureau provides a web page (that you can find by searching Frisco Colorado Lodging) with lodging details and visitor information. Larger places may be rented through places like Wildernest http://www.wildernest.com/ or 5 Diamonds Lodging http://www.highcountrylodges.com/

To fly in go to the Denver Airport – **do not** go to Eagle Vail unless you are renting a car.

The hotel is served from the Denver Airport by several van companies
        Colorado Mountain Express 800-525-6363 or 970-926-9800 vans
        Peak 1 express http://www.mountainshuttle.com/
        Summit express http://www.summitexpress.com/scheduled-shuttle-service/denver-airport-to-frisco-co-shuttle/

Greyhound also has an inexpensive bus service from Denver to Frisco (under $20 each way as of June 2011) but with limited timing options and a transfer in downtown Denver.

All take you to the area but go to the Frisco Transfer station for the cheapest rates (200 yards from Hotel)

Many services, restaurants, a Walmart and a grocery store are within walking distance, so a rental car is not a necessity. Also local bus service is free. Driving from the Denver airport takes 1.5 hours.

Fee, Payment, and Registration

The course fee depends on payment date and computer requirement. The following fee schedule applies:

For participants bringing an eligible lap top computer

        Fee normal participant - if payment received 14 or more days prior to start of
                class: $1950

        Fee - university student**, if payment received 14 days prior to start of class:
                $1350

        Fee - if paid later than 14 days prior to start of class: $2050

        Fee - university student**, if paid later than 14 days prior to start of class: $1450

For participants not bringing an eligible lap top computer

        Fee normal participant - if payment received 14 or more days prior to start of
                class: $2050

        Fee - university student**, if payment received 14 days prior to start of class:
                $1450

        Fee - if paid later than 14 days prior to start of class: $2150

        Fee - university student**, if paid later than 14 days prior to start of class: $1550

** Generally a student is one who is full time at the university being paid at a student rate or being unfunded. It is not someone finishing up a degree while working at a company or university earning non student wages.

An **eligible lap top** must
o   run windows 98 or greater,
o   be able to read CD-ROMs or a memory stick and
o   have more than 30 megabytes of available disk space

The fee includes an evaluation version of GAMS, a complete set of course notes (see sample course notes), and a CD containing all class examples, programs and backup documents. Checks, Visa, MasterCard, American Express, and purchase orders are accepted.

How to Register for Course

To register by phone, fax, or e-mail, contact:
Course Coordinator
GAMS Development Corp
tel: 202-342-0180
fax: 202-342-0181
email: courses@gams.com

To register by mail, send name, address, phone, fax, and email address (with payment or purchase order) to:

Course Coordinator
GAMS Development Corp.
1217 Potomac St, NW
Washington, D.C. 20007