

## Spring 2016: ACT SCI 654 — Regression and Time Series for Actuaries

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|--------------------|-------------------------|----------------------|-------------------------------------------------------------------------|
| <b>Instructor:</b> | Margie Rosenberg        | <b>Office:</b>       | 5191D Grainger                                                          |
| <b>Lec. Time:</b>  | M W – 2:30 P.M.         | <b>Off. Phone #:</b> | 262 - 1683                                                              |
| <b>Lec. Place:</b> | 2294 Grainger           | <b>Off. Hrs.:</b>    | M, W – 4:15 to 5:15 P.M.                                                |
|                    |                         | or by appt.          |                                                                         |
| <b>e-mail:</b>     | mrosenberg@bus.wisc.edu | <b>web site:</b>     | <a href="http://courses.bus.wisc.edu/">http://courses.bus.wisc.edu/</a> |

- Materials for Class

- **Regression Modeling with Actuarial and Financial Applications** (2011) by Edward W. Frees
- **R in Action, Second Edition** (2011) by Robert Kabacoff
- R and R Studio (freeware)
- Regression for Actuaries website
- On-line video tutorial (created as a result of SOA sponsored TEL grant)
- R and R Studio (freeware)
- Google to obtain additional R help
- Your ingenuity and attentive attendance

- Schedule

| Chapter          | Approx. # Lectures |
|------------------|--------------------|
| Introduction & R | 1                  |
| 1                | 1                  |
| 2                | 6                  |
| 6.3              | 1                  |
| 3                | 5                  |
| 4                | 6                  |
| 5                | 4                  |
| 6.1, 6.2         | 1                  |
| 20, 21           | 1                  |
| 7                | 2                  |
| 8                | 2                  |
| Total            | 29                 |

- Course Knowledge Goals:

- Provide hands-on exposure to linear regression and time series models for use in actuarial practice.
- Introduce R statistical software to estimate model parameters.
- Understand importance of checking model assumptions.
- Understand impact of choices of explanatory variables and ways to incorporate these variables in the model.
- Integrate regression concepts with other actuarial science courses including loss models, actuarial mathematics, and use of simulation.

- Course Doing Goals:

- To develop your critical thinking to solve problems: to learn to reason rather than to memorize.
- To develop your written and oral communication skills.
- To incorporate examples and problems, both in class and as assignments, to link the theory with real-life applications.

- (iv) To provide the opportunity to use computers in solving problems.
- (v) To develop your initiative in seeking what you do not understand, either with your research or you asking questions.
- (vi) To build a sense of camaraderie in and out of the classroom.
- (vii) To create a level of responsibility of accountability to work in teams to create a great project report.
- Course Being Goals:
  - (i) Being responsible to do homework and computer tutorials to learn.
  - (ii) Being responsible to your team member(s) to contribute to the project in timely and professional manner.
  - (iii) Being responsible **NOT to text in class**.
  - (iv) Being responsible to come to class and on-time (or a little early)
- Approaches:
  - (i) Lynda.com, TEL videos, internet
  - (ii) In-class/homework tutorials
  - (iii) Algebraic
  - (iv) Computer: use of computer classroom
  - (v) Verbal Interpretation
  - (vi) Your participation
- Importance of VEE class:
  - (i) Previously material tested; material better taught in classroom.
  - (ii) **Take hours would have studied for exam and apply to this course.**
  - (iii) Knowledge gained makes you unique; talk about practical skills gained both technical and communication.
  - (iv) Grade needed for professional credit (BC) is not guaranteed; you need to earn it.
- My Teaching Philosophy:
  - (i) To provide a quality classroom/office atmosphere conducive to learning.
  - (ii) To defy the notion of a *dumb* question. There is no such thing as a dumb question.
  - (iii) To bring my enthusiasm as an instructor to the classroom to motivate you to actively learn.
  - (iv) To actively involve you in the teaching/learning process: multi-way communication through classroom participation, continuous course feedback, office hours.
  - (v) To introduce you to computer tools that can be helpful in understanding and applying the material.
- Course Requirements:
  - (i) Reading of class material.
  - (ii) Reading, doing and thinking for homework and the in-class tutorials.
  - (iii) **Attend class and participate** in the educational process.
  - (iv) **No text messaging, emailing, or web browsing during class.** Wisconsin School of Business policy: the use of personal electronic technology (e.g. cell phone, iphone, ipod, blackberry, laptop computers, mp3 player) is not allowed during lectures or exams. Please disable your device prior to lectures. Any student who uses such technology during lecture will be asked to leave. Any student who uses such technology during an exam is in violation of the code of academic conduct of the University of Wisconsin-Madison.

- (v) Completion of weekly homework, saved as a PDF file, and uploaded to course website.
- (vi) Use CAS/SOA sponsored calculator on exams. Choice of TI BA-35, BAI Plus, BAI Plus Professional, 30X, 30Xa, 30X-II (IIs or I Ib).
- My Expectations for our Course:
  - (i) I will strive to provide you a thorough understanding of the material so that you can apply it in the workplace.
  - (ii) You will participate in class and provide feedback to me as to your understanding of the material.
  - (iii) I encourage you to come to office hours. I'm usually around late afternoons. Poke your head in my office to let me know that you are there. If I am with a person from class, we could have multiple people in my office.
  - (iv) I want you to spend time on homework. See *Homework Grading Philosophy* below.
- Attendance and Participation:
  - (i) I expect you to come to class and come to class on time. If you know that you will be late, please let me know in advance of the class.
  - (ii) To have an inspired class requires effort on the part of the instructor and the student. Participating in class, both answering my questions and asking your own, helps facilitate your knowledge as well as others.
  - (iii) As much as I pride myself on being sensitive to others, I cannot read your minds. Communication is a goal of this course.
  - (iv) See Participation Guidelines for more details.
- My Homework Philosophy:
  - (i) Encourage you to try and re-try problems so that you learn material, not just be able to re-create problem solutions.
  - (ii) To encourage you to solve problems without the penalty of wrong answers.
  - (iii) Provide guidance as to where you've gone astray and alternative solutions.
  - (iv) Encourage teamwork and creativity with computer assignments.
  - (v) My solutions will be posted on my website.
  - (vi) See Homework Guidelines for details on completing homework assignments.
- Project:
  - (i) You must work with at least one, but not more than 2, other classmates.
  - (ii) Goal of project is to apply regression to real-world data.
  - (iii) See Project Guidelines for more details.
- Grading
  - (i) Homework/Quizzes: 15%
  - (ii) Attendance/Participation/No Texting: 5%
  - (iii) No personal crib sheets permitted for in-class exams and final
  - (iv) Test 1 Thursday March 9 (in class): 25%
  - (v) Final Sunday May 8 at 5:05pm: 25%
  - (vi) Project: Due Friday May 6 at 11:59pm: 30%
  - (vii) Grade Criteria: A = 93%, AB = 89%, B = 80%, BC = 75%, C = 65%, D = 55%, F <55%