Economics 611  Game Theoretic Microeconomics  Spring 2014
Second Exam

All Syracuse University policies and procedures concerning academic honesty apply to this course:

"Syracuse University students shall exhibit honesty in all academic endeavors. Cheating in any form is not tolerated, nor is assisting another person to cheat. The submission of any work by a student is taken as a guarantee that the thoughts and expressions in it are the student's own except when properly credited to another. Violations of this principle include: giving or receiving aid in an exam or where otherwise prohibited, fraud, plagiarism, the falsification or forgery of any record, or any other deceptive act in connection with academic work. **Plagiarism is the representation of another's words, ideas, programs, formulae, opinions, or other products of work as one's own either overtly or by failing to attribute them to their true source.**" (Section 1.0, University Rules and Regulations)

**WARNING!!!**

While homework problems may have been done cooperatively, **exams are individual work**. Do not communicate about this exam with anyone except the instructor [x3-2345 or e-mail to jskelly@maxwell.syr.edu]. **Violation of this rule will result in a grade of 0 for the exam.** Any notices will be sent to you by e-mail; check occasionally.

**EXPLAIN** your answers carefully.

*Keep a Xerox copy of your answer to the take home part of the exam*

Take home part DUE: 9:30 am, Thursday, March 27th, at the start of class.

You must bring your completed exam to class (I urge you to make a copy). **Under no circumstances are you to give your exam to someone else to turn in for you.** Doing so will result in a grade of 0 for the exam.
EXPLAIN your answers carefully. The four problems are each worth 25 points. In each problem, you may want to draw diagrams. BE SURE your diagrams make sense, e.g., that relative slopes make sense.

1. (Signaling) Using the cost function
   \[ c(e, \theta) = \frac{e^2}{\theta} \]
   and utility function \( U_i = w - c(e, \theta) \) and assuming education affects productivity (value of marginal product for \( \theta \)-type = \( \theta + e \)), find all values of \( e \) such that there is a pure pooling equilibrium at \((e,w)\) for some \( w \). Assume \( \theta_L = 1 \) and \( \theta_H = 2 \), that half of the workers are \( H \)-type and half are \( L \)-type.

2. (Screening) We address the question: what role is played by having costs and marginal costs decrease in \( \theta \)? Using the cost function
   \[ c(t, \theta) = \theta \cdot t^2 \]
   (So you are multiplying by \( \theta \) instead of dividing by \( \theta \)), find as many Nash equilibria as you can (pure separating or pure pooling) in the screening model. Assume \( \theta_L = 1 \), \( \theta_H = 2 \), and reservation wages are 0 for everyone. Half of the workers are \( H \)-type and half are \( L \)-type. (Don’t worry about the stuff at the end of Chapter 13 about the possibility of pooling contracts or splitting contracts preventing the existence of Nash equilibria.)

3. (Weak perfect Bayesian equilibrium) On the next page there is displayed a game in extensive form. Determine all weak perfect Bayesian equilibria of this game.
TAKE HOME Part

DUE: 9:30 am, Tuesday, April 2, at the beginning of class.

4. (Screening) Consider the possibility of a splitting contract that breaks a separating equilibrium (see Figure 13.D.8) We want to know if this can happen when there is NOT a pooling contract that breaks the separating equilibrium (as in Figure 13.D.7).

For \( \theta_L = 1, \theta_H = 2, \) and cost function \( c(e, \theta) = e^2/\theta, \) does there exist a \( \lambda, 0 < \lambda < 1, \) where no pooling contract breaks, but there is a splitting contract that breaks? If some exist, show me one; if not, prove none exist.

Tree for Q3:

![Tree Diagram](image-url)