

Studying for the Exam. The best method of studying for the class exams is to (i) review the class notes and readings, (ii) work through the study guide, (iii) review the problems in the lecture notes, and (iv) attend the review session in the lecture period before the exam.

Everything covered in the notes and in class may be included on the exams, although clearly the exam will focus most of its attention on the material covered in lecture.

The hardest questions on the study guide are more difficult than the hardest questions on the midterm. So, if you can do everything on the study guide you should be in good shape for the exam. The actual problems on the exam will be similar to, but somewhat different from the practice problems included below.

I. Identify and or Define

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|-------------------------|-------------------------|
| a. Nash Equilibrium | k. Pareto Superior Move |
| b. Dominant Strategy | l. Progress |
| c. Best Reply Function | m. Utilitarian Ideal |
| d. Hobbesian Dilemma | n. Social Evolution |
| e. Commons Problem | o. Formeteur |
| f. Free Rider Problem | p. Marginal Product |
| g. Coordination Problem | q. Shirking |
| h. Externality Problem | r. Organization |
| i. Fraud | s. Work Ethic |
| j. Shirking Dilemma | t. Extent of Market |
| k. Ethical Disposition | u. F.A. Hayek |

II. Conceptual Problems and Puzzles

- (a) Explain the nature of the Hobbesian dilemma (in words). (b) It can be argued that humans have largely solved this problem for communities, but not among communities. Explain what is meant by this and also discuss the extent to which partial solution evidently have emerged. (c) Discuss why differences in community norms may generate conflict among communities.

- One of the themes of the first part of the course is that internalized norms can solve a variety of social dilemmas that reduce the attractiveness of living in communities. (a) Describe a few of the dilemmas and why they tend to make living in communities less attractive or impossible. (b) Explain how norms might emerge in small groups, if they recognize the nature of the problem. (c) Explain how such a norm may be internalized (habitualized) by members of the community and solve the problem addressed.
- James Buchanan has argued that small groups may jointly adopt rules while, in effect, sitting around a campfire discussing problems that the group confronts. He argues that the agreements would be “enforced” by some combination of promise keeping and reciprocity norms. (i) Explain how a reciprocity norm such as a tit-for-tat may produce behavior in accord with the rules agreed to at the campfire without requiring the norm or rule to be internalized. (ii) Now explain why such rules tend to work better if they eventually become internalized. (Hint: use one of rules that can solve one of the dilemmas developed in class as an illustration of Buchanan’s “norm by agreement” principle. Are there settings in which reciprocity will not induce the same behavior as an internalized norm?)
- Herbert Spencer (1851) claims that ethical disposition could in principle evolve to solve all of a community’s social dilemmas. In that case, he argues, no governments would be required. Discuss.
- One difference between John Locke’s conception of the “natural state” and Thomas Hobbes’ conception is that Locke argues that people have already internalized ethical rules (natural laws) and these help reduce conflict and promote productive relationships even if there is no law enforcing organization. (a) Explain why this may be true if norms emerge that ameliorate social dilemmas as argued in this class. (b) What are the limits of this process, if any?

III. Games and Puzzles: Applications of Game Theory and Ethics to Social Dilemmas

6. On the Advantage of Peace: Escaping from Hobbesian Anarchy.

Use a 3 by 3 game matrix to characterize the "Hobbesian Jungle."

- Is there a Nash equilibrium?
- Is the Nash equilibrium Pareto Optimal?
- Now assume that both players have internalized a "wrong to attack" norm. Show how the payoffs may change enough to escape from the Hobbesian dilemma.
- In a larger society would it be necessary for everyone to internalize this norm for peace to emerge?
- Discuss how government can substitute or augment internalized norms that oppose attacking others.
- Illustrate how a law enforcing government's effort to protect one's person and property can avoid the Hobbesian dilemma.

7. On the problem of fraud.

Construct a 3x2 game matrix that illustrates the problem of fraud. Assume that transactions cost exist and that fraudulent offers are potentially more profitable than honest one.

- Find the Nash equilibrium.
- Explain the nature of the problem at that equilibrium.
- Explain how ethical producers may avoid this problem?
- Explain why ethical producers tend to "crowd out" (displace) dishonest ones as their reputation(s) for honesty spreads.
- In what sense can market be said to support ethical conduct by sellers and producers?

8. On the advantages of Promise Keeping.

Construct a 3x3 game in which two persons can keep their promises all of the time, half of the time, or none of the time. Assume that for this community, keeping one's promises always yields the greatest aggregate utility, but that indi-

vidually each benefits when he/she breaches their promise and the other keeps it.

- Characterize the Nash equilibrium of this game
 - Are their mutual gains from adopting a norm of promise keeping?
 - Are their mutual gains from paying an enforcer (government) to enforce promises/contracts?
 - Show how either of the above can increase aggregate utility. (Hint: show how internal and external sanctions can change the payoffs and equilibrium.)
 - Show that either of the above solutions can be a Pareto Superior move.
- #### 9. On the advantages a Work Ethic.
- Construct a 3x3 game in which two persons contribute to each others productivity. The team's total output increases with each person's (team member's) work. However, suppose that the private rewards of free riding are always greater than those of working hard.
- Characterize the Nash equilibrium of this game
 - Are their mutual gains from internalizing a norm of working hard?
 - Are their mutual gains from paying an enforcer (firm owner or coop manager) to punish shirking?
 - Show how either of the above can increase aggregate output and utility. (Hint: show how the internal and external norms change the payoffs, etc.)
 - How do these results relate to Max Weber's theory of the emergence of capitalism?
 - How do these results relate to Mill's theory that prosperity (and aggregate utility) tend to increase as persons become "better" at cooperation.
 - Explain why "ethical employees" might be paid a premium wage for their services--other things (job related skills) being equal.
 - In what senses can labor markets be said to support ethics? What ethical dispositions would not be supported?

10. **On the ethical escapes from free-rider problems.** Construct a 2x2 game in which two persons can jointly produce or pay for a pure public good (such a clearing a sidewalk or road of snow).
- Explain why your game (its strategies and payoffs) illustrate the free rider problem that affects the supply of public goods.
 - Show how an internalized ethic can solve the problem.
 - Show how subsidies for contributions can solve the problem.
 - Explain why subsidies may be useful even in cases in which ethical dispositions tend to reduce free riding in many situations.

IV. More Game Theoretic Exercises

11. Find the Nash Equilibria to the following games and determine whether there is a “dilemma” or not. If there is one, explain the nature of the dilemma. If not explain why there is not.

Game Matrix 1

Al \ Bob	Work (A, B)	Shirk (A, B)
Ea = 8	10, 10	6, 12
Ea = 4	12, 6	8, 8

Game Matrix 2

Al \ Bob	Accept Offer (A, B)	Reject Offer (A,B)
Make Offer	10, 8	-3,-1
Don't Make Offer	-1, -3	5, 5

Game Matrix 3

Al \ Bob	Eb= 8 (A, B)	Eb=6 (A,B)	Eb=4 (A, B)	Eb=2 (A, B)
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Ea = 8	10, 10	8,11	6, 12	5, 13
Ea = 6	11, 8	9, 9	7, 7	6, 11
Ea = 4	12, 6	10, 7	8, 8	6, 9
Ea = 2	13, 5	11, 6	9, 6	7, 7

Game Matrix 4

Al \ Bob	Eb= 8 (A, B)	Eb=6 (A,B)	Eb=4 (A, B)	Eb=2 (A, B)
Ea = 8	10, 10	8,11	6, 12	5, 13
Ea = 6	11, 8	8, 8	7, 7	5, 6
Ea = 4	12, 6	7, 7	6, 6	5, 5
Ea = 2	13, 5	6, 5	5, 5	4, 4

12. As an exercise, construct a 3x3 game with a Pareto optimal equilibrium (i) in the middle cell (ii) in the upper lefthand cell, (iii) in the upper righthand and lower lefthand cells.
13. As an exercise, construct a 3x3 game with a dilemma equilibrium (i) in the middle cell (ii) in the upper lefthand cell, (iii) in the upper righthand and lower lefthand cells. Explain the nature of the dilemma in each case.

V. More Discussion Questions, Diagrams, and Further Puzzles (Unlikely to be covered on the first exam, but worth thinking about.)

14. Several of the authors that will be read in the second part of the course are skeptical about the effect of markets on virtue (as with More, Erasmus, and Montesquieu). Summarize their arguments. If such views were dominant, how would this affect the size of markets? [Assume that a significant number of persons (say 30%) take virtue into account when they choose their careers.]
15. Mill suggests that governments should promote the development of virtues that tend to increase progress. Review his argument and use a game

to illustrate why increasing such those virtues tends to increase social utility, social output (GNP), and/or growth rates.

16. Spencer argues that utilitarians neglect the ambiguity of their aggregate happiness norm. List at least 3 reasons why a utilitarian may have a difficult time choosing virtuous actions in a setting where his/her choice affects dozens of other persons.
17. Laboratory experiments suggest that a good deal of human behavior is inconsistent with the predictions of game theory based on narrow models of self-interest. For example, experiments normally find a good deal of cooperation in PD games, which is far more than the "zero" predicted. On the other hand, there is significant defection.
 - a. What do these experiments imply about the norms participants bring to the game?
 - b. What do these experiments tell you about the limits of game theory as a model of human decision making?
 - c. How can they be used to shed light on the role of internalized norms in human behavior?