

THE UNIVERSITY OF THE WEST INDIES, MONA  
**ECON3003: Game Theory**

Semester II

Pre-requisites: ECON2016 & ECON 1005

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Office: E206 SAMB

Office Hours: Mon 6 – 7 pm & Tue 10 – 11 am

(If you cannot make these times you can email me or text or  
WhatsApp me at 406 – 7956 to arrange a meeting. P.S. Please  
don't send me any "Please call me" texts – I will not call.)

## Description

Game theory is the study of optimal decision making among rational competitors, called players. It takes into account the interactions among the players and their behaviours to develop optimal strategies. Game theory has wide applications in diverse fields, for instance, economics, business, political science, biology and computer science. In this course we will discuss the different types of games and the different methods that are used to obtain optimal strategies. We will also explore some applications of game theory to the study of economics.

## Learning Outcomes

Upon successful completion of this course, the student should be able to:

- Represent games in the extensive and strategic (normal) forms.
- Apply the principle of dominance to games.
- Find Nash equilibria – pure, mixed strategy and Bayesian
- Determine the type of information contained in a game.
- Find Nash equilibria in the Cournot Game.
- Find subgame perfect Nash equilibria.
- Apply game theory to problems in economics.

## Modes of Delivery

Two lecture hours and one tutorial hour per week. Problem sets (not for grading) will be provided for practice at problem solving.

## Assessment

Course Work - 50%

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|------------------------------|-----|
| - Two assignments @ 15% each | 30% |
| - One mid semester exam      | 20% |

Final Exam – 50%

# Syllabus

## 1. Representation of Games

- 1.1 Definitions
- 1.2 The Extensive Form
- 1.3 The Strategic (or Normal) Form

## 2. Analyzing Behaviour in Static Games

- 1.1 Dominated and Dominant Strategies: The Prisoner's Dilemma
- 1.2 Iterated Dominance
- 1.3 Nash Equilibrium

## 3. Information

- 3.1 Information Sets and Partitions
- 3.2 Perfect, Certain, Symmetric and Complete Information
- 3.3 The Harsanyi Transformation and Bayesian Games

## 4. Mixed and Continuous Strategies

- 4.1 Mixed Strategies
- 4.2 The Calculus Method
- 4.3 The Pay – off equating Method
- 4.4 Continuous Strategies: The Cournot Game

## 5. Dynamic Games with Symmetric Information

- 5.1 Sequential Rationality and Backward Induction
- 5.2 Subgame Perfectness
- 5.3 The Game of Nuisance Suits

## Resources

**Texts:** 1. Eric Rasmusen, *Games and Information, 4<sup>th</sup> Edition*

2. Joel Watson, *Strategy, 2<sup>nd</sup> Edition*