MATHEMATICS 121

GAME THEORY

Text: *Games, Theory and Applications*, by L. C. Thomas (out of print, first five chapters reprinted by UCR Printing and Reprographics)

Games in extensive, normal and characteristic forms as models for conflict and/or cooperation. Two-person zero-sum games, minimax theorem, relations to linear programming. Nash equilibrium theorem, bargaining, the core, Shapley value. Economic market games.

TOPICS   SUGGESTED NO. OF
                                                        WEEKS' COVERAGE

Overview of game theory .... $\frac{1}{2}$
    (§§ 1.1–1.4)

    Examples of games, teminology and history of game theory.

Two-person zero-sum games 3
    (§§ 2.1–2.10)

    Extensive and normal forms, maximin criterion, mixed strategies, minimax theorem, domination, worthwhile strategies, solutions of matrtix games, equilibrium pairs, games with perfect information.

Two-person nonzero-sum games 3
    (§§ 3.1–3.11)

    Differences with zero-sum games, examples, equilibrium pairs, Nash's theorem, finding pairs, solution concepts, cooperative games, bargaining or negotiation set, Nash's axioms, maximin bargaining solution, threat bargaining solution.

N-person games .... $1\frac{1}{2}$
    (§§ 4.1–4.8)

    Noncooperative games, characteristic functions and strategic equivalence, imputations, the core, stable sets, nucleolus, Shapely value.

Market games 1
    (§§ 5.1–5.5)

    Edgeworth market games, $[1,1]$-, $[M,N]$-, $[1,N]$- and $[N,N]$-market games.