

MATEMÁTICAS PARA CIENCIA POLÍTICA

Posgrado en Ciencia Política

Otoño 2017 (Optativa)

CIDE

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Día y horario:

OBJETIVOS: Este curso presenta tanto los conceptos y herramientas matemáticas básicas para el análisis formal y cuantitativo en Ciencia Política como sus posibles aplicaciones en elecciones, negociación legislativa y elección social. El objetivo es preparar a los estudiantes para tomar cursos avanzados dentro de la División de Estudios Políticos que incluyan teoría de juegos y teoría de la elección racional, así como la modelación matemática de elecciones y negociación. Se asume que los estudiantes saben álgebra de nivel preparatoria y están familiarizados con nociones básicas de cálculo.

EVALUACIÓN:

TEMARIO:

1. Repaso de Cálculo Diferencial e Integral
 - Sucesiones, convergencia de sucesiones, límites, supremos e ínfimo, continuidad, la derivada y la derivada parcial.
 - Concepto de la integral, métodos de integración (sustitución, por partes y fracciones parciales). La integral impropia.
2. Optimización
 - Condiciones de primer y segundo orden, puntos críticos, optimización sin restricciones, método de los multiplicadores de Lagrange, programación no lineal (Kuhn-Tucker)
3. Álgebra lineal
 - Espacios vectoriales, matrices, operaciones con matrices, vectores, determinantes, matrices inversas, transformaciones lineales, sistemas de ecuaciones, formas cuadráticas, valores y vectores propios.
4. Topología
 - Conjuntos abiertos y cerrados. Conexidad, compacidad. Base de una topología. Espacio topológico. Espacio vectorial topológico. Espacios métricos y normados. Homomorfismo e isomorfismos. Topología de R y de R^n . Introducción a las variedades.
5. Aplicaciones
 - Elección social: preferencias, agregación, reglas de votación, teorema de Arrow, teorema de Gibbard, teorema de Nakamura

- Negociación legislativa: Modelos Downsianos con información asimétrica, fijador de agenda, status quo endógeno, modelo de acción colectiva
- Negociación dinámica: juegos dinámicos mayoritarios, equilibrio entre coaliciones, formulación de políticas públicas, teoría dinámica del gasto público, estabilidad de coaliciones
- Elecciones dinámicas con información incompleta: riesgo moral, selección adversa, votante mediano, isomorfismo de modelos de selección adversa, modelos de negociación Baron-Ferejohn

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