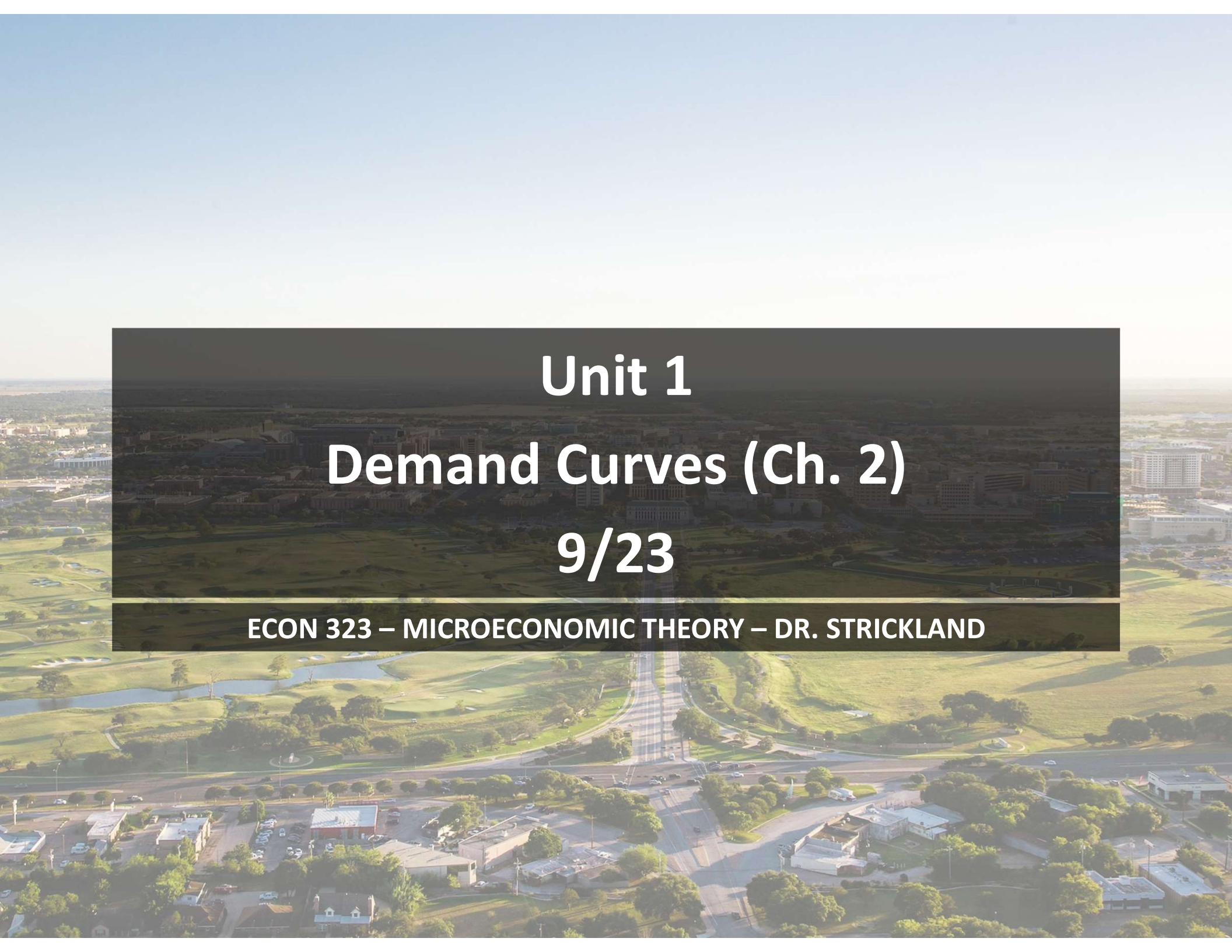


Unit 1
Demand Curves (Ch. 2)
9/23

ECON 323 – MICROECONOMIC THEORY – DR. STRICKLAND

Characterizing Price Elasticity of Demand

$\varepsilon_D = \frac{\%\Delta Q_D}{\%\Delta P} \Rightarrow$

A $1\%\ \Delta P \Rightarrow \varepsilon_D\ \%\ \Delta Q_D$

e.g. $\varepsilon_D = -2$

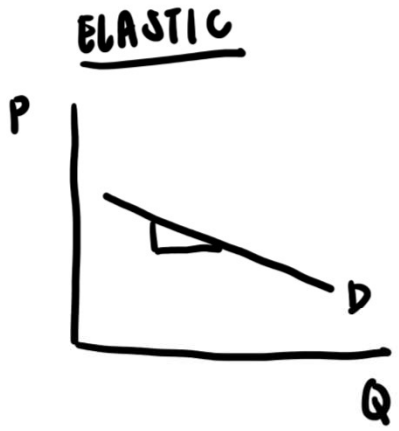
When price elasticity of demand is high…

- **Elastic** $|\varepsilon_D| > 1$
- Infinitely high? **Perfectly elastic** $|\varepsilon_D| = \infty$

When price elasticity of demand is low…

- **Inelastic** $|\varepsilon_D| < 1$
- Zero? **Perfectly inelastic** $|\varepsilon_D| = 0$

UNIT ELASTIC: $|\varepsilon_D| = 1$



Cross-price Elasticity of Demand

Cross-price elasticity of demand: the percentage change in the *quantity demanded* of one good divided by the percentage change in the *price* of another good

$$\varepsilon_{D_{xy}} = \frac{\%\Delta Q_{D_x}}{\%\Delta P_y}$$

$$= \frac{\Delta Q_{D_x}}{\Delta P_y} \cdot \frac{P_y}{Q_{D_x}}$$

P_y — OLD / ORIG.

Q_{D_x} — OLD / ORIG.

IF < 0 => COMPLEMENTS

IF > 0 => SUBSTITUTES

IF $= 0$ => UNRELATED

Let's practice!

SLOPE OF DEMAND: $\frac{\Delta Q}{\Delta P} = -50$

Suppose the demand for Cinemark movie tickets is given by:

Q=f(P)

$$Q^D = 1{,}000 - 50P$$

SLOPE INVERSE DEMAND: $\frac{\Delta P}{\Delta Q} = \frac{-1}{50}$

a. Calculate the price elasticity of demand when the price of tickets is $5.

AT A PRICE

$$\varepsilon_D = \frac{1}{\text{slope}} \cdot \frac{P}{Q_D}$$

$$\varepsilon_D = \frac{1}{(-1/50)} \cdot \frac{P \to 5}{Q_D}$$

$Q_D = 1000 - 50(5) = 750$

INVERSE DEMAND:

$Q_D = 1000 - 50P$

$50P = 1000 - Q_D$

$P = \frac{1000}{50} - \frac{1}{50} Q_D = 20 - 0.02 Q_D$

$$\varepsilon_D = \frac{1}{-0.02} \cdot \frac{5}{750}$$

$$= \boxed{-0.333}$$ *INELASTIC

b. Calculate the price elasticity of demand when the price of tickets increases from $8 to $9.

BTWN PRICES

$$\varepsilon_D = \frac{\%\Delta Q_D}{\%\Delta P} = \frac{\Delta Q_D}{\Delta P} \cdot \frac{P}{Q_D}$$

$$\varepsilon_D = \frac{\left[\frac{550-600}{600}\right]}{\left[\frac{9-8}{8}\right]} = \frac{550-600}{9-8} \cdot \frac{8}{600}$$

P=8: $Q_D = 1000 - 50(8) = 600$

P=9: $Q_D = 1000 - 50(9) = 550$

$$= \boxed{-0.667}$$ *INELASTIC

Let's practice!

Consider the demand for Stanley cups (the tumbler, not the hockey trophy). At a price of $45, consumers purchase 4,500 cups each day.

$P_x = \$45$

Suppose the price of a related good falls from $40 to $30. Consumers then purchase 3,000 Stanley cups each day. What is the cross-price elasticity of demand?

$$\varepsilon_{Dxy} = \frac{\%\Delta Q_{Dx}}{\%\Delta P_y} = \frac{\Delta Q_{Dx}}{\Delta P_y} \cdot \frac{P_y}{Q_{Dx}}$$

$P_y = \$40 \Rightarrow Q_x = 4{,}500$

$P_y = \$30 \Rightarrow Q_x = 3{,}000$

$$= \frac{\left[\frac{3{,}000 - 4{,}500}{4{,}500}\right]}{\left[\frac{30-40}{40}\right]} = \frac{3{,}000-4{,}500}{30-40} \cdot \frac{40}{4{,}500}$$

$$= \boxed{1.33} > 0$$

RELATED GOOD IS A SUBSTITUTE!