**Finance/Financial Engineering Comprehensive Exam**

The exam is closed book. You can use a letter-sized sheet of hand-written notes and a calculator.

Part 1: ECON 233

(32 points)

1. *(4 pts.)* Does holding a bond until maturity eliminate interest rate risk? Why or why not?
2. *(4 pts.)* What does the historical record show about the risk-reward trade-off in finance?
3. *(4 pts.)* Why would anyone buy a bond at a price above face value, thus guaranteeing themselves a capital loss when holding the bond to maturity?
4. *(4 pts.)* How do you calculate beta, and what does it measure?

Please **show all calculations**. If you're stuck, **assume a solution** to get full credit on a later part.

1. *(8 pts.)*It's Jan. 22, 2015. You're thinking of buying a corporate bond with a coupon rate of 0.42%, which matures on May 6, 2019. The appropriate yield to maturity is 0.58%. The bond has a face value of $1,000 and pays interest semiannually. The next coupon will be paid in 104 days. What should be the invoice price (in $)?
2. *(8 pts.)*ABC Corp. has just paid a quarterly dividend of $0.31. ABC's dividends will grow by 5% for the next 4 quarters, and then grow by 0.4% thereafter. ABC has a quarterly required return of 4%. What is the intrinsic value of ABC stock?

Part 2: ECON 236

(32 points)

1. *(8 pts.)*Suppose that LIBOR rates for maturities of 1, 2, 3, 4, 5, and 6 months are 2.6%, 2.9%, 3.1%, 3.2%, 3.25%, and 3.3% with continuous compounding. What are the forward rates for future 1-month periods?
2. *(8 pts.)*Suppose you currently own 500 shares of Netflix stock. The current price of Netflix is $P\_{NFLX}=\$152.21$ and the stock has a CAPM beta of 0.96. The current price of the S&P 500 ETF is $P\_{SPY}=\$243.90$. How many shares of the ETF would you need to buy or sell to reduce your beta to 0.5?
3. *(8 pts.)*The closing price of Intercontinental Exchange Inc. (ticker ICE) stock on 19 Jun 2017 was $P\_{2017}=\$64.77. $One year earlier, on 20 Jun 2016, ICE stock closed at $P\_{2016}=\$50.54. $Calculate the percentage return per annum with:
	* + - 1. Annual compounding.
				2. Semiannual compounding.
				3. Monthly compounding.
				4. Continuous compounding.
4. *(8 pts.)*Union Pacific Corp. (ticker UNP) stock currently trades for $109.44. A call option with strike $105.00 is valued at $10.35 and a put option with the same strike is valued at $5.35. Draw the net (not gross) payoff diagram for a covered call, using specific values for the strike, option price and stock price. What asset is equivalent to a covered call?