

MATH 1620 MATHEMATICS OF FINANCE

3 Credits

Offered in Lecture Format

Prerequisite required (MATH 0600 or MATH 1600 with a grade of C or better
or Appropriate Placement-Test Score)

Revised 04/06/93

SYLLABUS

I. SIMPLE INTEREST

- A. Formula for simple interest: $I = Prt$
 - 1. Solve for I
 - 2. Solve for P, r, or t
- B. Formula for maturity value: $S = P + I$
- C. Two types of interest
 - 1. Ordinary interest
 - 2. Exact interest
- D. Two types of time
 - 1. Ordinary
 - 2. Exact
- E. Formula for present value: $P = \frac{S}{1 + rt}$
- F. Equations of value
- *G. Investment analysis
 - 1. Discount all cash flows at a given rate
 - 2. Find internal rate of return
- H. Partial payments
 - 1. Merchants' Rule
 - 2. U.S. Rule

II. BANK DISCOUNT

- A. Formula for bank discount: $D = Sdt$
 - 1. Solve for D
 - 2. Solve for S, d or t
- B. Formula for proceeds: $P = S - D$
- C. Formula for maturity value: $S = \frac{P}{1 - dt}$
- D. Conversion of discount rate to interest rate and vice versa:
$$r = \frac{d}{1 - dt}, \quad d = \frac{r}{1 + rt}$$
- E. Value of a promissory note at any point in time.

III. COMPOUND INTEREST

- A. Formula for compound interest: $S = P(1 + i)^n$
 - 1. Solve for S
 - 2. Solve for i or n (linear interpolation)

- B. Effective interest rate
- C. Interest for part of a period
- D. Present value at compound interest: $P = S(1 + i)^{-n}$
- E. Extension of tables
- F. Equations of value

IV. ANNUITIES

A. Ordinary

1. Amount of ordinary annuity: $S_n = Rs_{n|i}$
 - a. Solve for S_n
 - b. Solve for R , n , or i
2. Present value: $A_n = Ra_{n|i}$
 - a. Solve for A_n
 - b. Solve for R , n , or i
3. Extension of tables
4. Amortization and sinking funds

*B. Annuity due: $S_n = R(s_{n+1|i} - 1)$, $A_n = R(a_{n-1|i} + 1)$

*C. Deferred annuity: $A_n = Ra_{n|i}(1+i)^{-m}$

*V. PERPETUITIES

*Optional