



THEOINT – Theory of Interest
 Prerequisite: MATH115

Prerequisite to: LIFECO1

Instructor: _____
Consultation Hours: _____

Contact details: _____
Class Schedule and Room: _____

Course Description

A three-unit course on the theory of measurement of interest, annuities, extinction of debts by amortization and sinking funds, bonds and other securities.

| Learning Outcomes | |
|---|--|
| On completion of this course, the student is expected to present the following learning outcomes in line with the Expected Lasallian Graduate Attributes (ELGA) | |
| ELGA | Learning Outcome |
| Critical and Creative Thinker Effective Communicator Lifelong Learner Service-Driven Citizen | At the end of the course, the student will apply appropriate mathematical and statistical concepts and processes, tools and softwares in the solution to various investment problems |

| Final Course Output | | |
|---|---|----------|
| As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term. | | |
| Learning Outcome | Required Output | Due Date |
| At the end of the course, the student will apply appropriate mathematical and statistical concepts and processes, tools and softwares in the solution to various investment problems. | A written group project on the discussion of valuation of bonds or discounted cash flow analysis. | Week 13 |

| Rubric for assessment | | | | |
|---|---|--|--|--|
| <i>Written Group Report</i> | | | | |
| CRITERIA | Excellent (4) | Good (3) | Satisfactory (2) | Needs Improvement (1) |
| Content | Demonstrates in-depth understanding of concepts and skills with no error | Demonstrates understanding of concepts and skills with one or two errors | Demonstrates some understanding of concepts and skills with minimal errors | Demonstrates minimal understanding of concepts and skills with so many errors |
| Organization | Presented concepts/skills which were logically organized with complete supporting ideas | Presented concepts/skills which were logically organized with some supporting ideas | Presented concepts/skills which were minimally organized with minimal supporting ideas | Presented concepts/skills which were poorly organized and lacked supporting evidence |
| Integration | Demonstrates integration of the concepts presented | Demonstrates some integration of the concepts presented | Demonstrates limited integration of the concepts presented | Demonstrates no integration of the concepts presented |
| Accuracy of Computation s/ Solutions | Computations/solutions are correct and explained correctly | Computations/solutions are correct but not explained well. | Computations/solutions have some errors. | Incorrect computations /solutions |
| Overall Presentation and creativity | Overall presentation is creative and artistic with innovative ideas | Overall presentation shows some effort in its creativity and artistic value with some innovative ideas | Overall presentation shows limited effort in its creativity and artistic value with limited innovative ideas | Overall presentation is neither creative nor artistic with no innovative ideas |

| Group Member Assessment | | | | |
|--------------------------------|--|---|--|--|
| CRITERIA | EXCELLENT 4 | VERY GOOD 3 | SATISFACTORY 2 | NEEDS IMPROVEMENT 1 |
| Contribution | Group member completed an equal share of work and strived to maintain that equity throughout the project | Group member contributed significantly, but other members clearly contributed more | Group member contributed little toward the project | Group members contributions were insignificant or nonexistent |
| Dependability | Group member provided contributions with 100% punctuality and always appeared for group work | Group member contributions were mostly punctual and almost always appeared for group work | Group member contributions were regularly late and often missed scheduled group work | Group member was undependable forcing other members to take up the slack |
| Efficiency | Work performed was very useful and contributed significantly to the final product | Participation was inefficient and thus contributions were less than expected | Work performed was inappropriate and mostly useless toward the final product | Work performed was completely ineffective and useless in the final product |
| Attitude | Group member was very positive and pleasant to work with | Group member didn't complain but offered little enthusiasm | Group member sometimes complained and was somewhat of a burden | Group member often complained and generally demoralized the group |

Additional Requirements

Aside from the learning output, the student will be assessed at other times during the term by the following:

- Skills Check (Seatwork/Quizzes/Boardwork)
- Individual/Group Report
- Individual/Group Problem Set

Grading System

| | FOR EXEMPTED STUDENTS (w/out Final Exam) | FOR STUDENTS with FINAL EXAM | | Scale: | |
|--------------------|---|------------------------------|-------------------------|---------|-----|
| | | with no missed quiz | with one missed quiz | | |
| Average of quizzes | 90% | 60% | 50% | 95-100% | 4.0 |
| Project | 10% | 10% | 10% | 89-94% | 3.5 |
| Final exam | -- | 30% | 40% | 83-88% | 3.0 |
| | | | | 78-82% | 2.5 |
| | | | | 72-77% | 2.0 |
| | | | | 66-71% | 1.5 |
| | | | | 60-65% | 1.0 |
| | | | | <60% | 0.0 |

Learning Plan

| LEARNING OUTCOME | TOPIC | WEEK NO. | LEARNING ACTIVITIES |
|---|--|----------|--|
| At the end of the course, the student will apply appropriate mathematical and statistical concepts and processes, tools and softwares in the solution to various investment | I. THE MEASUREMENT OF INTEREST 1.1 Accumulation and Amount Functions 1.2 The Effective Rate of Interest 1.3 Simple Interest and Compound Interest 1.4 The Effective Rate of Discount 1.5 Simple Discount and Compound Discount 1.6 Nominal Rates of Interest and Discount | Week 1-3 | Library work Group discussion and presentations Problem Sets Computer Laboratory Activity |

| | | | |
|----------|---|--------------|---|
| problems | 1.7 Forces of Interest and Discount 1.8 Varying Interest 1.9 Solutions to Problems in Interest | | |
| | Quiz No1 | Week 4 | |
| | II. SOLUTIONS OF PROBLEMS IN INTEREST 2.1 The Basic Problem 2.2 Equation of Value 2.3 Finding Unknown Time and Rate of Interest | Week 4-5 | Library work Group discussion and presentations Problem Sets Computer Laboratory Activity |
| | Quiz No 2 | Week 5 | |
| | III. BASIC ANNUITIES 3.1 Annuity-Due and Annuity-Immediate 3.2 Annuity Values on Any Date 3.3 Perpetuities 3.4 Nonstandard Terms and Interest Rates 3.5 Finding Unknown Time and Rate of Interest 3.6 Varying Interest 3.7 Annuities Not Involving Compound Interest | Week 6-8 | Library work Group discussion and presentations Problem Sets Computer Laboratory Activity reflection |
| | Quiz No 3 | Week 9 | |
| | IV. MORE GENERAL ANNUITIES 4.1 Annuities Payable at Different Frequency than Interest is Convertible 4.2 Continuous Annuities 4.3 Basic and More General Varying Annuities 4.4 Continuous Varying Annuities | Week 9 – 11 | Library work Group discussion and presentations Problem Sets Computer Laboratory Activity |
| | V. AMORTIZATION SCHEDULES AND SINKING FUNDS 5.1 Finding the Outstanding Loan Balance 5.2 Amortization Schedules 5.3 Sinking Funds | Week 11 – 12 | Library work Group discussion and presentations Problem Sets Computer Laboratory Activity |
| | Final Examination | | |

References

- Brown, R.L. and Zima, P. (1996) *Shaum's Outline of Theory and Problems of Mathematics of Finance*. New York: McGraw-Hill
- Hart, William. (1980). *Mathematics of Investment*. Manila: National Bookstore
- Kellison S., (1991) *The Theory of Interest*, (2nd edition). Boston: McGraw Hill
- Ong, A. and Gabriel P. (1988) *Mathematics of Investment*. Manila: Island Publishing House

Online Resources

- Annuity Due*. Accessed October 25, 2012 from: www.annuities-financial-planning.com/annuity-due.html
- Amortization Schedule Calculator*. Accessed October 25, 2012 from: www.amortization-schedule.info
- Yield Rate Definition*. Accessed October 25, 2012 from: www.allbusiness.com/glossaries/yield-rate/4946301-1.html

Class Policies

1. The required minimum number of quizzes for a 3-unit course is 3, and 4 for 4-unit course. No part of the final exam may be considered as one quiz.
2. Cancellation of the lowest quiz is not allowed even if the number of quizzes exceeds the required minimum number of quizzes.
3. As a general policy, no special or make-up tests for missed exams other than the final examination will be given. However, a faculty member may give special exams for
 - A. approved absences (where the student concerned officially represented the University at some function or activity).
 - B. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious.
4. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination.
5. If the student has no valid reason for missing an exam (for example, the student was not prepared to take the exam) then the student receives 0% for the missed quiz.
6. Students who get at least 89% in every quiz are exempted from taking the final examination. Their final grade will be based on the average of their quizzes and other prefinal course requirements. The final grade of exempted students who opt to take the final examination will be based on the prescribed computation of final grades inclusive of a final examination. Students who missed and/or took any special/make-up quiz will not be eligible for exemption.
7. Learning outputs are required and not optional to pass the course.
8. Mobile phones and other forms of communication devices should be on silent mode or turned off during class.
9. Students are expected to be attentive and exhibit the behavior of a mature and responsible individual during class. They are also expected to come to class on time and prepared.
10. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed.
11. Students who wish to go to the washroom must politely ask permission and, if given such, they should be back in class within 5 minutes. Only one student at a time may be allowed to leave the classroom for this purpose.
12. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course.
13. Only students who are officially enrolled in the course are allowed to attend the class meetings.

Approved by:

DR. ARTURO Y. PACIFICADOR, JR.

Chair, Department of Mathematics