LESSON PLAN

Date/ Revision	29 June2016
Faculty	Business & Social Science
Approval	Dr. Samuel Prasetya

SUBJECT : BUSINESS MATHEMATICS 1

1. Identification of Subject:

Name of Subject   : Business Mathematics 1
Code of Subject   : MGNT-1100
SKS   : 2/3
Semester   : 1
Study Program   : B-IBA/B-MGT/B-HTM/B-INR
Lecturer   :

2. Competency

After having the course, students are expected to:
a) Use mathematical skill for solving Equations and Inequalities.
b) Understand what a function is and know how to graph them.
c) Develop the line properties of the demand and supply curves and its equation, calculate maximum revenue through quadratic functions, and determine the point of equilibrium, Break Even Points and its Profit and Loss in Systems of Equations.
d) Study exponential function and their applications to compound interest.
e) Extend the notion of compound interest to include effective rates and to solve interest problems whose solutions requires logarithm.
f) Calculate the present values; solve problems involving the time value of money, net present value of cash flows by using equations of value.
g) Have broad knowledge of ordinary annuities, annuities due by using geometric series to model the present value and the future value of an annuity.
h) Determine payments to be placed in a sinking fund.
i) Know how to amortize a loan and set up an amortization schedule.

3. Description of Subject:

This course is designed to enable students to learn and apply mathematics skills to a business and management setting in the company. It covers topics using mathematics in the workplace as well as in one's personal life.

4. Learning Approach

Approach   : Combination of Expository - inquiry and colaborative
Method   : Discussion, question answer, sample problem, group work
Student Task   : Home work, presentation
Media   : LCD projector, film.

5. Evaluation

a) Absence maximum   : 25%
b) Participation in discussion   : 5 points
c) Homework, Classwork   : 5 points
d) Presentation, Simulation   : 10 points
e) Daily Quiz   : 20 points
f) Final Examination   : 60 points

Total   : 100 points

6. Book Reference:

- **Text Book:**
  Ernest Haeussler, Richard Paul, Richard Wood (2013). *Introductory Mathematical Analysis for Business, Economics, and the Life and Social Sciences: Pearson New International Edition 13th Edition.* Paperback, 864 pages ISBN: 9781292021140

7. Detail of Lecturing Activity (LESSON PLAN):

WEEK   : 1
Duration   : 2 x 50 minutes
Topic   : Applications of Equations and Inequalities
Sub-Topic   : 1.1 Applications of Equations
                1.2 Linear Inequalities

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To model situations described by linear or quadratic equations
- To solve linear inequalities in one variable and to introduce interval notation.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the course objective, regulation and policy • Introduce the Textbooks Chapter 1		Lecturing
Delivery	• Applications of Equations • Linear Inequalities	• Listening into the Lecturer • Read the Text Book • Take notes	Beamer/ LCD Black / White Board

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
		• Solve problems	
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 1		

WEEK : **2**

Duration : 2 x 50 minutes

Topic : Applications of Equations and Inequalities

Sub-Topic : 1.3 Applications of Inequalities

Quiz

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To model situations in terms of inequalities
- Answer the Quiz

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the subsection 1.3 objectives. • Introduce the objective of evaluation of Chapter 1		Lecturing
Delivery	• Applications of Inequalities • Quiz	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 1		

WEEK : 3
Duration : 2 x 50 minutes
Topic : Functions and Graphs
Sub-Topic : 2.1 Functions
2.2 Special Functions

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To understand what a function is and to determine domains and function values.
- To introduce constant functions, polynomial functions, rational functions and case-defined functions.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Chapter 2		Lecturing
Delivery	• Functions • Special Functions	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 2		

WEEK   : **4**
Duration   : 2 x 50 minutes
Topic   : Functions and Graphs
Sub-Topic   : 2.3 Combinations of Functions
                 2.4 Graphs in Rectangular Coordinates

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To combine functions by means of addiction, subtraction, multiplication, division, multiplication by a constant and composition.
- To graph equations and functions in rectangular coordinates, to determine intercepts, to apply the vertical-line test, the horizontal-line test, and to determine the domain and range function from a graph.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Subsection 2.3 and 2.4		Lecturing
Delivery	• Combinations of Functions • Graphs in Rectangular Coordinates	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 2		

WEEK　　　　　:　5
Duration　　　　:　2 x 50 minutes
Topic　　　　　:　Evaluation of Chapter 2
Sub-Topic　　　:　Quiz

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To solve the problems in the Quiz

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Evaluation of Chapter 2		Lecturing
Delivery	• Review of Chapter 2 • Quiz	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 2		

WEEK   : 6
Duration   : 2 x 50 minutes
Topic   : Lines, Parabolas, and Systems
Sub-Topic   : 3.1 Lines
                 3.2 Applications and Linear Functions

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To develop the notion of slope and different forms of equations of lines.
- To develop the notion of demand and supply curves and to introduce linear functions.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Chapter 3		Lecturing
Delivery	• Lines • Applications and Linear Functions	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 3		

WEEK   : 7
Duration   : 2 x 50 minutes
Topic   : Evaluation
Sub-Topic   : Evaluation

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To solve the problems in the Evaluation

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	Introduce the objective of evaluation		Lecturing
Delivery	• Evaluate and take score for the evalutaion based on: ❖ Problems; ❖ Formula used; ❖ Speed	• Do the Evaluation	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 1-3.2		

WEEK : 8
Duration : 2 x 50 minutes
Topic : Lines, Parabolas, and Systems
Sub-Topic : 3.3 Quadratic Functions
3.4 Systems of Linear Equations

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To sketch parabolas arising from quadratic functions.
- To solve systems of linear equations in both two and three variables by using the technique of elimination by addition or by substitution.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Subsection 3.3 and 3.4		Lecturing
Delivery	• Quadratic Functions • Systems of Linear Equations	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 3		

WEEK   :   9
Duration   :   2 x 50 minutes
Topic   :   Lines, Parabolas, and Systems
Sub-Topic   :   3.5 Applications of Systems of Equations
                  Quiz

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To solve system describing equilibrium and break-even points.
- Answer the Quiz

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Subsection 3.5		Lecturing
Delivery	• Applications of Systems of Equations • Quiz	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the quiz	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 3		

WEEK : **10**

Duration : 2 x 50 minutes

Topic : Exponential and Logarithmic Functions

Sub-Topic : 4.1 Exponential Functions

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To study exponential functions and their applications such as areas as compound interests.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Chapter 4		Lecturing
Delivery	• Exponential Functions	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 4		

WEEK   : **11**
Duration   : 2 x 50 minutes
Topic   : Mathematics of Finance
Sub-Topic   : 5.1 Compound Interest
                   5.2 Present Value

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To extend the notion of compound interest to include effective rates and to solve interest problems whose solutions require logarithms.
- To study present value and to solve problems involving the time value of money by using equations of value. To introduce the net present value of cash flows.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Chapter 5		Lecturing
Delivery	• Compound Interest • Present Value	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 5		

WEEK : **12**

Duration : 2 x 50 minutes

Topic : Mathematics of Finance

Sub-Topic : 5.3 Annuities

5.4 Amortization of Loans

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To introduce to notions of ordinary annuities and annuities due. To use geometric series to model the present value and future value of an annuity. To determine payments to be placed in a sinking fund.
- To learn how to amortize a loan and set up an amortization schedule.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Subsection 5.3 and 5.4		Lecturing
Delivery	• Annuities • Amortization of Loans	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 5		

WEEK : **13**
Duration : 2 x 50 minutes
Topic : Evaluation of Chapter 4-5
Sub-Topic : Quiz

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:
- To solve the problems in the Quiz

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	• Introduce the Objective of Evaluation of Chapter 4 and 5		Lecturing
Delivery	• Review of Chapter 4 and 5 • Quiz	• Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz	Beamer/ LCD Black / White Board
Closing	• Inform the student the next meeting material • give assessment / homework to the students		
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book Chapter 4 and 5		

WEEK : **14**
Duration : 2 x 50 minutes
Topic : Review material
Sub-Topic : Chapter 1-5

Learning Outcomes of Lesson:
1. **Main Competency**. The students are expected able to solve the problems.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer / Facilitator Activity	Students activity	Method / Lecturing Tools / Remarks
Introduction	• Review Chapter 1-5		Lecturing
Delivery	• Review Chapter 1-5	• Listening into the Lecturer • Read the Text Book • Solve the problems • Take notes	Beamer/ LCD Black / White Board Students Laptop
Closing	• Inform the student the next final exam materials and topics.	• Listening to the lecturer	Lecturing
Evaluation	• evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem		
Reference	Text Book : Chapter 1-5		