
LESSON PLAN

Date/ Revision 29 June 2016
Faculty Business & Social Science
Approval Dr. Samuel Prasetya

SUBJECT : BUSINESS MATHEMATICS 2

1. Identification of Subject:

Name of Subject : Business Mathematics 2
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) Understand the concept of a matrix and use them to solve a linear system.
- b) Understand geometrically the solution of a linear inequality in two variables and extend it to a system of linear inequalities.
- c) Able to use the simplex method to solve problems that cannot be solved geometrically.
- d) Understand the basic counting principle and to extend it to permutations and combination.
- e) Understand the properties of probability and its applications in business statistics.

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 collaborative
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 : Matrix Algebra
Sub-Topic : 6.1 Matrices
6.2 Matrix Addition and Scalar Multiplication
6.3 Matrix Multiplication

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To introduce the concept of a matrix and to consider special types of matrices.
- To define matrix addition and scalar multiplication and to consider properties related to these operations.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the course objective, regulation and policy • Introduce the Textbooks Chapter 6 		Lecturing
Delivery	<ul style="list-style-type: none"> • Matrices • Matrix Addition and Scalar Multiplication • Matrix Multiplication 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework 		

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
	to the students		
Evaluation	<ul style="list-style-type: none"> evaluate the students activity during the lesson evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 6		

WEEK : 2
Duration : 2 x 50 minutes
Topic : Matrix Algebra
Sub-Topic : 6.4 Solving Systems by Reducing Matrices
 Quiz

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To show how to reduce a matrix and to use matrix reduction to solve a linear system.
- To solve the problems in the quiz.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the subsection 6.4 objectives. • Introduce the objective of evaluation of Chapter 6 		Lecturing
Delivery	<ul style="list-style-type: none"> • Solving Systems by Reducing Matrices • Quiz 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 6		

WEEK : 3
Duration : 2 x 50 minutes
Topic : Linear Programming
Sub-Topic : 7.1 Linear Inequalities in Two Variables
 7.2 Linear Programming

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To geometrically represent the solution of a linear inequality in two variables and to extend this representation to a system of linear inequalities.
- To state the nature of a linear programming problem, to introduce terminology associated with it, and to solve it geometrically.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Chapter 7 		Lecturing
Delivery	<ul style="list-style-type: none"> • Linear Inequalities in Two Variables • Linear Programming 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 7		

WEEK : 4
Duration : 2 x 50 minutes
Topic : Linear Programming
Sub-Topic : 7.4 The Simplex Method

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To show how the simplex method is used to solve a standard linear programming problem. This method will allow you to solve problems that cannot be solved geometrically.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> Introduce the Objective of Subsection 7.4 		Lecturing
Delivery	<ul style="list-style-type: none"> The Simplex Method 	<ul style="list-style-type: none"> Listening into the Lecturer Read the Text Book Take notes Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> Inform the student the next meeting material give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> evaluate the students activity during the lesson evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 7		

WEEK : 5
Duration : 2 x 50 minutes
Topic : Evaluation of Chapter 7
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	<ul style="list-style-type: none"> • Introduce the Objective of Evaluation of Chapter 7 		Lecturing
Delivery	<ul style="list-style-type: none"> • Review of Chapter 7 • Quiz 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 7		

WEEK : 6
Duration : 2 x 50 minutes
Topic : Introduction to Probability and Statistics
Sub-Topic : 8.1 Basic Counting Principle and Permutations
 8.2 Combination and Other Counting Principles

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To develop and apply the Basic Counting Principle and to extend it to permutations.
- To discuss combinations, permutations with repeated objects..

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Chapter 8 		Lecturing
Delivery	<ul style="list-style-type: none"> • Basic Counting Principle and Permutations • Combination and Other Counting Principles 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 8		

WEEK : 7
Duration : 2 x 50 minutes
Topic : Evaluation Chapter 6-8.2
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	<ul style="list-style-type: none"> • Evaluate and take score for the evaluation based on: <ul style="list-style-type: none"> ❖ Problems; ❖ Formula used; ❖ Speed 	<ul style="list-style-type: none"> • Do the Evaluation 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 6-8.2		

WEEK : 8
Duration : 2 x 50 minutes
Topic : Introduction to Probability and Statistics
Sub-Topic : 8.3 Sample Spaces and Events
 8.4 Probability

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To define what is meant by the probability of an event.
- To develop formulas that are used in computing probabilities.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Subsection 8.3 and 8.4 		Lecturing
Delivery	<ul style="list-style-type: none"> • Sample Spaces and Events • Probability 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 8		

WEEK : 9
Duration : 2 x 50 minutes
Topic : Introduction to Probability and Statistics
Sub-Topic : 8.5 Conditional Probability and Stochastic Processes
 8.6 Independent Events

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To discuss conditional probability via a reduced sample space as well as the original space.
- To develop the notion of independent events and apply the special multiplication law.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Subsection 8.5 and 8.6 		Lecturing
Delivery	<ul style="list-style-type: none"> • Conditional Probability and Stochastic Processes • Independent Events 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 8		

WEEK : 10
Duration : 2 x 50 minutes
Topic : Evaluation of Chapter 8
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	<ul style="list-style-type: none"> • Introduce the Objective of Evaluation of Chapter 8 		Lecturing
Delivery	<ul style="list-style-type: none"> • Review of Chapter 8 • Quiz 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 8		

WEEK : 11
Duration : 2 x 50 minutes
Topic : Additional Topics in Probability
Sub-Topic : 9.1 Discrete Random Variables and Expected Value
 9.2 The Binomial Distribution

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To develop the probability distribution of a random variable and to represent that distribution geometrically by a graph or a histogram. To compute the mean, variance and standard deviation of a random variable.
- To develop the binomial distribution and relate it to the binomial theorem.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Chapter 9 		Lecturing
Delivery	<ul style="list-style-type: none"> • Discrete Random Variables and Expected Value • The Binomial Distribution 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 9		

WEEK : 12
 Duration : 2 x 50 minutes
 Topic : Continuous Random Variables
 Sub-Topic : 16.1 Continuous Random Variables
 16.2 The Normal Distribution

Learning Outcomes of Lesson:

After studying this chapter the students should be able to do the following:

- To introduce continuous random variables; to discuss density functions, to compute the mean, variance and standard deviation for a continuous random variable.
- To discuss the normal distribution, standard units and the table of areas under the standard normal curve.

DETAIL OF LECTURING ACTIVITY

Phase	TOPIC: Lecturer & Facilitator Activity	Students activity	Method, Lecturing Tools & Remarks
Introduction	<ul style="list-style-type: none"> • Introduce the Objective of Chapter 16 		Lecturing
Delivery	<ul style="list-style-type: none"> • Continuous Random Variables • The Normal Distribution 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 16		

WEEK : 13
Duration : 2 x 50 minutes
Topic : Evaluation of Chapter 6-9, 16
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	<ul style="list-style-type: none"> • Introduce the Objective of Evaluation of Chapter 6-9 and 16 		Lecturing
Delivery	<ul style="list-style-type: none"> • Review of Chapter 6-9 and 16 • Quiz 	<ul style="list-style-type: none"> • Listening into the Lecturer • Read the Text Book • Take notes • Solve problems • Do the Quiz 	Beamer/ LCD Black / White Board
Closing	<ul style="list-style-type: none"> • Inform the student the next meeting material • give assessment / homework to the students 		
Evaluation	<ul style="list-style-type: none"> • evaluate the students activity during the lesson • evaluate and observe, how the students solve the problem 		
Reference	Text Book Chapter 6-9, 16		

WEEK : 14
Duration : 2 x 50 minutes
Topic : Review material
Sub-Topic : Chapter 6-9,16

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	<ul style="list-style-type: none"> Review Chapter 6-9,16 		Lecturing
Delivery	<ul style="list-style-type: none"> Review Chapter 6-9,16 	<ul style="list-style-type: none"> Listening into the Lecturer Read the Text Book Solve the problems Take notes 	Beamer/ LCD Black / White Board Students Laptop
Closing	<ul style="list-style-type: none"> Inform the student the next final exam materials and topics. 	<ul style="list-style-type: none"> Listening to the lecturer 	Lecturing
Evaluation	<ul style="list-style-type: none"> evaluate the students activity during the lesson evaluate and observe, how the students solve the problem 		
Reference	Text Book : Chapter 6-9,16		