YOGYAKARTA STATE UNIVERSITY
FACULTY OF MATHEMATICS AND NATURAL SCIENCE

LESSON PLAN

FRM/FMIPA/063-00
1 April 2010

1. Faculty /Study Program : Mathematics and Science/Mathematics Education
2. Course & Code : Computer Application, MAA311
3. Credit : Theory : 2 sks Practice: 1 sks
4. Semester/Time : IV, Time: 100 minutes
5. Basic competence : Students can use MATLAB to solve some problems in matrices, its operation and manipulation
6. Indicator :

   Student can determine : Definition of Matrix in MATLAB, Size of a matrix, Transpose of a matrix, Special Matrices, The Identity Matrix, Diagonal Matrix, Building Matrix, Extracting Bits of Matrix, Dot product of matrices, Matrix-vector products, Matrix-Matrix Products, Sparse Matrix, Inverse of Matrix, Determinant, The sum Function for matrix, maximum and minimum for matrix, and find a value in matrix.
7. Essential Concepts : Computer application for manipulating matrix using MATLAB
8. Learning Activity : 3

Component	Detail Activity	Time	Method	Media	References	Character
Opening	Lecturer explains the objective of the course and motivates students related to topic	5’	Explanation and Discussion	Computer, LCD	A:11	Thinking logically, critically, creatively, and innovatively Caring about social matters and environment Appreciative of works and achievements of others
Main Activities	• Students trying the commands of matrices, operate and manipulate matrices by following the instruction in handout using computer • Lecturer guides students to get the main meaning of the matrices commands, make some notes in handout and conclusions • Lecturer facilitate students to get more information about the material	80’	Explanation Demonstration, Discussion, practice, group work			
Closure	Students are asked to expose their conclusion	10’				
Follow up	Students are asked to collect some problems in	5’				

	matrices from journal, articles, Internet					

Learning Activity : 4 (practice, 1 sks practice = 100')

Component	Detail Activity	Time	Method	Media	References	Character
Opening	Lecturer greets tudents and asks some students to tell the main idea of last topic Lecturers delivers a lab sheet	5'	Explanation and Discussion	Computer, worksheet		Thinking logically, critically, creatively, and innovatively
Main Activities	Students practice and doing exercises to solve some matrices problem using MATLAB	80'	Practicum using computer, by self/in a group		worksheet / quiz	Caring about social matters and environment
Closure	Lecturer gives feedback to the result of students' work	10'	Explanation			Appreciative of works and achievements of others
Follow up	Lecturer gives introduction of the next material Students are asked to read the next material in handout and open HELP in MATLAB about the material	5'	Explanation			

9. Assessment

Quiz:

i) Given $A=\begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 1 & 1 \end{bmatrix}$ $B=\begin{bmatrix} 4 & -1 \\ 0 & 2 \end{bmatrix}$ $C=\begin{bmatrix} 1 & 4 & 2 \\ 3 & 1 & 5 \end{bmatrix}$ $D=\begin{bmatrix} 1 & 5 & 2 \\ -1 & 0 & 1 \\ 3 & 2 & 4 \end{bmatrix}$ $E=\begin{bmatrix} 6 & 1 & 3 \\ -1 & 1 & 2 \\ 4 & 1 & 3 \end{bmatrix}$

Determine the element of	variable	Determine the element of	variable
1. the 2th row and 3th column of C*(D*E)	CDE23	6. first column of B*A	BA1
2. first row of A*B	AB1	7. the 2nd and 3rd column of D	D23
3. the 2nd column of A*B	AB2	8. the 1-2 row and 1-2 column of E	E12
4. the 3rd row of A*A	AA3	9. the 2-3 row of D	D2
5. the 3rd row of A*B	AB3	10. the 1-2 row of E	E1

ii). Using the special matrices command, i.e. **magic, zeros, ones,eye, pascal**, generates the new matrices below.

1. $\begin{pmatrix} 16 & 2 & 3 & 13 & 1 \\ 5 & 11 & 10 & 8 & 1 \\ 9 & 7 & 6 & 12 & 1 \\ 4 & 14 & 15 & 1 & 1 \\ 0 & 0 & 0 & 0 & 100 \end{pmatrix}$ 2. $\begin{pmatrix} 1 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 0 \end{pmatrix}$ 3. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 0 \\ 0 & 1 \end{pmatrix}$

4. $\begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$ 5 $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 6 \end{pmatrix}$ 6. $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 6 \\ 1 & 1 & 1 \end{pmatrix}$ 7. $\begin{pmatrix} 0 & 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 2 & 3 \\ 0 & 1 & 0 & 1 & 3 & 6 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{pmatrix}$

10. Reference

Compulsory:

A. Sri Andayani, Handout of Computer Application, FMIPA UNY 2009

Additional:

B. Hanselman, D. & Littlefield, B. 2000. Mastering MATLAB, A Comprehensive Tutorial and Reference. Prentice-Hall International, Inc.

C. http://www.matworks.com/**access/helpdesk/help/**

D. http://www.math.siu.edu/matlab/tutorial2.pdf

Yogyakarta, 21 December 2010
Professor,

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