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BADM 341.01: Systems and Operations

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BADM 341
SYSTEMS & OPERATIONS
COURSE OUTLINE--SPRING 2004 (Tentative)

Course Objectives and Approach

BADM 341 is a survey course, which bridges the gap between the *design* and the *utilization* of information systems. Information systems connect the enterprise (private or public, profit or nonprofit) to its contemporary environment, and generate essential information for use within and among its functional areas. The course stresses the following points:

1. The absolute necessity for computers and information systems in today's world

2. The design of information systems to meet the tactical and strategic needs of the enterprise

3. The implementation and use of information systems within the enterprise's operations function

The global economy is changing at an alarming rate. For example, nearly every day, the efficiency of production tools increases, computer power soars, new sources of energy emerge, and unexpected demographic pressures evolve. Change is everywhere. The enterprise's informed managers must keep up with all these changes and devise appropriate strategies to take advantage of them. Thus, the need for information and information systems is vital. This is especially true in the operations function. Operations is the core of the organization because it produces the goods or services that ultimately generate revenue.

To beat the competition, Operations must constantly strive to make the enterprise's products faster, cheaper, and better. The objective is to exceed customers' expectations. To accomplish this, Operations implements and uses very sophisticated information systems, which process vast amounts of data and distribute the resulting information throughout the organization. Operations managers use daily, repetitive information to analyze costs, schedule production, control inventory, enhance quality, improve productivity, and prepare status reports. They use long-range, predictive information, i.e., demand forecasts, to assess the customers' changing expectations, exceed competitors' potential to satisfy those expectations, and execute the business strategy. Frequently, the business strategy calls for capacity expansion, new product introductions, and/or reengineering processes. Without formal information systems, the magnitude and complexity of the operations managers' responsibilities would overwhelm them.

Required Material

Jessup/Valacich and Krajewski/Ritzman. *Information Systems and Operations Management Today*, a custom text for The University of Montana.

Grading

Letter grades for the course will be based on performance on the following instruments:

Test 1	30%
Test 2	30%
Final Exam	40%
	100%

Homework

Prior to coming to class, each student is expected to have solved the "Discussion Problems" listed in the syllabus. The problems will serve as a direct basis for the tests. That is, there is a high probability that a subset of the problems will appear in a slightly altered form on the tests. Thus, a student who has conscientiously prepared each problem will have also prepared well for the tests. The homework will not be collected nor graded. Six sets of solutions to the problems are reserved in the Mansfield Library.

Tests

The tests will be conducted during the class periods indicated and will be approximately 80 minutes in length. Each test will cover the material presented in class and assigned as homework. It will contain short essay/problem type questions. It may also contain true/false and/or multiple choice questions.

Final

The exam will consist of short essay/problem type questions covering the material discussed in class and assigned in the textbook. It may also contain true/false and /or multiple choice questions.

Rescheduling a Test

A student desiring to reschedule a test must present the instructor with a satisfactory reason at least one week prior to the exam date. The tests must be made up within one week after their scheduled dates.

Problem Assignment for Chapter 4

1. An entrepreneur is starting a new business. The activities and times required are given below:

Activity	Immediate Predecessors	a	m	b
a	-	1	3	5
b	-	1	2	3
c	a	2	3	4
d	a	3	4	6
e	b,c	2	3	7
f	b,c	1	3	4
g	d,e	2	4	6

a. Draw an AOA network diagram.
b. Calculate the expected time and variance for each activity.
c. Calculate the expected time and variance for the entire project.
d. What is the probability the project can be completed in 14 days?

2. A plant startup is based on the following CPM network:

Activity	Immediate Predecessors	Normal Time (Days)	Normal Cost ($)	Crash Time (Days)	Crash Cost ($)
a	-	4	100	2	150
b	-	8	80	2	140
c	-	2	40	1	60
d	a	3	80	2	120
e	a	5	80	3	140
f	c	5	60	1	100
g	b,d	6	120	2	160

a. Draw an AOA network diagram.
b. What is the ES, LS, EF, LF, and slack for each activity (use normal time)?
c. What is the normal project completion time and normal cost?
d. Identify the critical path.
e. How much will it cost to crash the project by 1 day? By 2 days?

Problem Assignment for Chapter 12

3. The K&R Camera Shop sells all the latest cameras and accessories. To meet customer demand, the manager must forecast demand for the items she sells. Lately the XR-42S zoom lens has been very popular. Recent monthly demand for this item has been as shown:

Month	Number of Lenses Sold
1	12
2	17
3	15
4	20
5	18
6	23

a. Forecast XR-42S demand for months 4-6, using a weighted moving average. The weights are 0.5, 0.3, and 0.2, where 0.5 refers to the most recent demand.
b. Repeat part a, using exponential smoothing with α=0.2. Assume that the average at the end of month 2 was 15 lenses.
c. What is the forecast for week 7, using each method?
d. For each of the forecasts in parts a and b above, calculate the cumulative sum of the forecast error (CFE) and mean absolute deviation (MAD). Based on CFE and MAD, which of the two forecasting techniques is doing the best job?

Problem Assignment for Assembly Line Balancing

4. An assembly line must produce 40 microwave ovens per hour. The following data give the necessary information:

Task	Time (Sec)	Preceding Tasks
A	20	None
B	55	A
C	25	B
D	40	B
E	5	B
F	35	A
G	14	D,E
H	40	C,F,G

a. Draw a precedence diagram (AON).
b. What cycle time (in seconds) ensures the desired output rate?
c. What is the theoretical minimum number of stations?
d. What is the theoretical maximum efficiency?
e. Balance the assembly line.

Week	Discussion Topic	Reading Assignment	Discussion Questions and Problems
1	Introduction: Information Systems Introduction: Operations Management	Ch 1 (J/V) Ch 1 (K/R)	Q1-9 & P1 Q3 & P2
2	Project Management: Constant Time Network	Ch 4 (K/R)	Q1 & Q2
3	Project Management: Project Evaluation and Review Technique Project Management: Critical Path Method	Ch 4 (K/R) Ch 4 (K/R)	P1 (Attached) P2 (Attached)
4	Database Management Telecommunications and the Internet	Ch 3 (J/V) Ch 4 (J/V)	Q1-10 & P1 Q1-10 & P1
5	Electronic Commerce, Intranets, and Extranets Organizational Systems Enterprise-Wide Information Systems **TEST NUMBER 1 (Friday, 27 Feb.)**	Ch 5 (J/V) Ch 6 (J/V) Ch 7 (J/V) Weeks 1-5	Q1-10 & P1 Q1-15 & P1 Q1-10 & P1
6	Forecasting: Moving Average Forecasting: Exponential Smoothing	Ch 12 (K/R) Ch 12 (K/R)	P1 P3 (Attached)
7	Forecasting: Forecast Errors Process and Layout Strategy: Theory	Ch 12 (K/R) Ch 3 (K/R)	P8
8	Assembly Line Balancing Inventory Management: EOQ and Q-System	Lecture Material Ch 13 (K/R)	P4 (Attached) P6 & P12
9	Inventory Management: P-System **TEST NUMBER 2 (Friday, 26 March)**	Ch 13 (K/R) Weeks 6-9	P17
10	Aggregate Planning Master Production Scheduling and Material Requirements Planning: Techniques	Su G (K/R) Su G (K/R)	 P3, P4 & P7
11	Master Production Scheduling and Material Requirements Planning Lean Systems: Just-In-Time	Ch 15 (K/R) Ch 16 (K/R)	P1, P7, P12 & P13 Q1 & Q2
12	Total Quality Management The Deming of America	Ch 6 (K/R) Video	Q1, Q2 & Q3
13	Quality Control: Acceptance Sampling Quality Control: Statistical Process Control	Lecture Material Ch 7 (K/R)	 P4 & P7
14	Working in America: Hazardous Duty Review for Final Exam	Video Lecture Material	
15	**FINAL EXAM**	Weeks 10-15	