

**GOVERNORS STATE UNIVERSITY  
COLLEGE OF HEALTH PROFESSIONS  
HEALTH ADMINISTRATION PROGRAM**

**Course Syllabus**

**COURSE TITLE:** QUANTITATIVE DECISION MAKING FOR  
HEALTH ADMINISTRATION

**COURSE NUMBER:** HLAD 806

**INSTRUCTOR:** Ralph Bell, Ph.D.

**CREDIT HOURS:** 3.0

**TRIMESTER OFFERED:** AY 2000-2001



**Course Description:**

This course emphasizes the conceptual frameworks and the practical applications of various decision making techniques relevant to health administration. The focus of the course is on developing decision making models and using available software which enable the administrator to make the best decision to assist in achieving organizational goals and objectives.

**Prerequisites:**

Statistics, HLAD 705, and MIS 725

**Course Rationale:**

Most of a health administrator's work falls into two broad categories:

- (1) *Decision making* which involves choosing among alternative courses of action to help maximize organizational goals and objectives;

and

- (2) *Control* which involves ensuring that organizational goals and objectives are being met and will continue to be met.

To successfully engage in these two types of activities, administrators must have the ability to formulate the problem, identify and develop appropriate assumptions relevant to the question at hand, recognize and define constraints on the decision making process, and develop the appropriate model to identify the best course of action. HLAD 806 provides students with the skills and knowledge necessary to participate in decision making and control activities required of health administrators.

**Intended Audience:**

Second year health administration graduate students

**Competencies:**

Upon completion of this course, the student will be able to:

1. Formulate administrative problems quantitatively.
2. Understand and use a sound decision making framework.
3. Apply decision making techniques to:

Planning projects

Make choice decisions based on "make/buy" models

Develop queuing models

4. Build and interpret models analyzing simple and complex stochastic processes.
5. Use computer software for problem solving.
6. Understand and apply ethics in making health care related decisions.

**Approach to the Course:**

This course will combine a lecture/discussion format with computer applications. Students will learn both the proper techniques and the appropriate software to solve a series of assigned problems.

**Requirements:**

Course grades will be determined by three examinations involving problem solving using the computer. Each exam will constitute 1/3 of the final grade.

Incompletes will not be granted for this course without advance approval of a written request specifying legitimate reasons for the extension.

**Required Texts:**

Austin, C.J., and S. Boxerman. **Quantitative Analysis for Health Services Administration**. Ann Arbor: Health Administration Press, 1995.

**Disability Statement:**

Students who have a disability or special needs and require accommodation in order to have equal access to the classroom, must register with the designated staff member in the Division of Student Development. Please go to Room B1201 or call (708) 534-4090 and ask for the Coordinator of Disability Services. Students will be required to provide documentation of any disability when an accommodation is requested.

**Topic 1: Introduction****Instructional Objectives:**

The following topics will be discussed:

1. Defining objectives within an organizational context.
2. Where to begin.
3. Overview of the decision making framework.
4. The health administrator's role in decision making.

**Readings:**

Austin and Boxerman - Introduction and Chapter 1

Darr, K., "Problem solving revisited". *Hospital Topics*, 76(2): 27-32, 1998.

Saaty, T.L., 'Reflections and projections on creativity in operations research and Management science: a pressing need for a shift in paradigm'. *Operation Research*, 40(1): 11-16, 1998.

Shorcliffe, E.H., "When decision support doesn't support". *Medical Decision Making*, 15(2): 187-188.

Willemain, T.R., "Model formulation: what experts think about and when". *Operations Research*, 43(6): 916-932, 1995.

## **Topic 2: Make/Buy Decisions and Break-Eve Analysis**

### **Instructional Objectives:**

The following topics will be discussed:

1. Scenarios with linear costs.
2. "Stepped" cost scenarios.
3. Break-even analyses.
4. **Microsoft Excel**

### **Readings:**

Austin and Boxerman - Chapter 2

Boles, K.E. and S.T. Fleming, "Breakeven under capitation: pure and simple?". *Health Care Management Review*, 21(1): 38-47, 1996.

Brosh, I. "The methodology of the quantitative approach". Chapter 2 in **Quantitative Techniques for Managerial Decision Making**. Reston: Reston Publications, 1985.

Goggins, T.P., "The use of break even analysis in long-term care facilities". *The Journal of Long-Term Care Administration*, 9(1): 1-9, 1981.

Stritecky, R. and P. Pirozek, "A case study of the breakeven point of the premature children's unit of the children's clinic at Jindrichuv Hradec Hospital, Czech Republic". *The Journal of Health Administration Education*, 15(3): 201-206, 1997.

## **Topic 3: Tools for Project Planning and Control**

### **Instructional Objectives:**

The following topics will be discussed:

1. Project scheduling with **Harvard Project Manager**.
2. PERT networking
3. Gantt Charts

### **Readings:**

Austin and Boxerman - Chapter 8

Birge, J.R., "Bounds on expected project tardiness". *Operations Research*, 43(5): 838-850, 1995.

D'Aquila, N.W., "Facilitating inservice programs through PERT/CPM". *Nursing Management*, 24(3): 92-96, 1993.

Wesley, M.L. and A. Easterling, "Improving clinical care through project management". *Nursing Administration Quarterly*, 15(4): 22-28, 1991.

#### **Topic 4: Linear Programming**

##### **Instructional Objectives:**

The following topics will be discussed:

1. Simple deterministic analysis.
2. Complex deterministic analysis
3. Linear optimizing using **Microsoft Excel**.
4. Simple stochastic processes.
5. Complex stochastic processes.

##### **Readings:**

Austin and Boxerman - Chapter 5

Hsing, Y. and E.O. Bond, "In search of productivity and hospital size: a case study". *Health Care Supervisor*, 14(2): 50-55, 1995.

Mangasarian, O.L., W.N. Street, and W.A. Wolberg, "Breast cancer and prognosis via Linear programming". *Operations Research*, 43(4): 570-577, 1995.

Robbins, W.A. and N. Tuntiwongpiboon, "Linear programming: a useful tool in case-mix Management". *Healthcare Financial Management*, June: 114-116, 1989.

Sier, D., P. Tobin, and C. McGurk, "Scheduling surgical procedures". *Journal of the Operations research Society*, 48(9): 884-891, 1997.

## **Topic 5: Queuing Theory and Applications**

### **Instructional Objectives:**

The following topics will be discussed:

1. The fundamentals of queuing theory, including:

- Arrival processes
- Service rates
- Single server/multi-server models
- Cost estimation
- System statistics
- System performance measures

2. Analyzing queuing models with **Microsoft Excel**

### **Readings:**

Austin and Boxerman - Chapter 7

Dershin, H. and M.S. Schaik, "Quality improvement for a hospital patient transportation System". *Hospital and Health Services Administration*, 38(1): 111-119, 1993.

### ***If Time Permits***

## **Topic 6: Forecasting**

### **Instructional Objectives:**

The following topics will be discussed:

1. Forecasting the demand for health services
2. Long-term demand
3. Intermediate demand
4. Short-term demand
5. Forecasting with **SPSS-PC**

**Readings:**

Cody, M, L. Fries, and Z.C. Hawkinson, "Predicting hospital profitability in short-term General community hospitals". *Health Care Management Review*, 20(5): 77-87, 1995.

Frank, R.G. and T.G. McGuire, "Estimating the cost of mental health and substance abuse coverage". *Health Affairs*, 14(3): 102-115, 1995.

Ruben, D.B. et al., "How many physicians will be needed to provide medical care for older persons? Physician manpower needs for the twenty-first century". *Journal of the American Geriatric Society*, 41(4): 444-453, 1993.