

Title: **Pharmacoeconomics**
Course number: 25PADM 812
Credits: 3 graduate credit hours
Prerequisites: 25PADM611
Meeting times: MWF 10:00 a.m. - 10: 50 a.m.
Meeting location: 231 Health Professions Building

I. Instructor Information

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II. Catalog Description

This course is an introduction to Outcomes Research focusing on the economic, clinical and humanistic dimensions. It covers cost/consequence analysis, decision analysis and quality of life measures in health care.

III. Course Mission

This course will provide doctoral candidates with an understanding of the application of pharmacoeconomic principles in interpreting cost consequence studies of pharmaceutical and other therapeutic modalities. The course examines sources, reliability and validity of operational measures of costs, clinical, economic and quality of life outcomes and prepares the student to be a discerning reader of published pharmacoeconomic studies..

IV. Educational Outcomes

This course contributes to the achievement of the following outcomes of the Center for the Advancement of Pharmaceutical Education (CAPE):

- Provide Pharmaceutical Care
- Promote Public Health Communication
- Valuing and Ethical Decision Making

V. Course Objectives

A. Knowledge - At the end of this course, the Doctoral Candidate will be able to:

- Distinguish between the major types of cost/consequence studies and explain the varying components of costs/consequences in each
- Critically evaluate the scientific rigor of a cost/consequence study
- Explain and interpret decision analyses of medical treatments
- Explain the need and methods for demonstrating reliability and validity in quality of life measures
- Review and prioritize the key considerations in selection of a health related quality of life measure

- Discuss the administration, scoring and interpretation of commonly used generic and disease specific health related quality of life measures
- B. Skills – At the end of this course, the Doctoral Candidate will be able to:
- Apply the foregoing knowledge concepts in justifying and selecting cost/consequence measures for study of pharmacotherapy in a specific disease state
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- C. Values and Attitudes – At the end of this course, the Doctoral Candidate will tend to:
- accept the value of organization, precision and scientific pharmacoeconomic thinking.
 - regard pharmacoeconomic studies as fundamental tools to improve allocation of pharmaceutical care for patients.
 - be committed to the importance of pharmacoeconomic principles as a crucial foundation on which to optimize drug therapy.
 - Organize values for internal consistency
 - Exhibit a characteristic pharmacoeconomic behavior based upon their value system.

IV. Teaching methods

Course material is presented in interactive lectures with various computational or review assignments. Students are responsible for readings in the required text as well as material from class meetings. Each class meeting includes at least one active learning (in groups of two) exercise. Students will also generate a patient profile for a person with a specified illness for use in completing Quality of Life measures.

V. Assessment

There will be two examinations at the times shown on the course schedule. Students will be evaluated on material from lectures by all instructors, assigned readings (texts and articles), and homework assignments. The assessment of these outcomes (and related objectives) will use traditional multiple choice, matching, and short answer formats. Written examinations using case/simulations or problems will employ a short answer/essay format. Individual and group homework assignments (written) will also be used as assessment tools. The midquarter examination will be worth 30% and the final examination 50% of the final grade.

Students will also be assessed on their work on exercises assigned at varying points throughout the course. These will be worth 20% of the final grade.

IX. Grading Policies

Ethical standards: The University Student Code of Conduct and the Code of Ethics of the American Pharmaceutical Association will be in effect for this course. A candidate found in violation of this section will receive a score of zero (0%) for the work in question and will be reported to the Dean's office.

Disability: Any candidate with a disability that may potentially interfere with his/her performance in this course should contact the instructor during the first week of class.

Course Withdrawal: The University policy on withdrawal from this course will be followed.

Missed exams or assignments: Any examination or assignment can only be made up with the prior approval of the instructor.

Incomplete grades: Incomplete grades will only be given with the prior approval of the instructor.

Criteria for letter grades: Final grades will be assigned in compliance with the grading policies published by the Office of the Registrar, Student Records. No incomplete grade will be given without the course coordinator's approval. The following grades will be used:

<u>Percentage</u>	<u>Letter Grade</u>
90-100	A
86-89	B+
80-85	B
76-79	C+
70-75	C
0-59	F

X. Text and Materials

Required text: Drummond, MF, O'Brien, B, Stoddart GL and Torrance, GW, Methods for the Economic Evaluation of Health Care Programmes, 2nd Edition (Oxford: New York) 1997.

Decision analysis by Treeage (DATA 3.5) A Windows software package for decision analysis.

Recommended reference: Spilker, Bert, Editor, Quality of Life and Pharmacoeconomics in Clinical Trials, (Lipincott-Raven: Philadelphia) 1996, 1,259 pages.

Required materials: Scientific calculator

XI. Course schedule

See attached schedule of lectures, readings, mid-term, homework, written or computer assignments and final exam.

Lecture Topics, Readings and Assignments

Sep 25: Lecture 1: Pharmacoepidemiology

Sep 27: Lecture 2: Cost Benefit Analysis

Sep 30: Lecture 3: CBA, (cont.)

Oct 2: Lecture 4a: Value in Health Care

Greater demands than resources available,
Resources shrinking, How to decide on use of resources?

Oct 2: Lecture 4b: Cost/consequence analyses,

CMA
CEA
CUA
CBA

Text Reading: Chapter 2

Oct 4: Lecture 5: Economic Concepts and Terminology

Allocation of Resources
 Macroeconomics
 Microeconomics
 Health economics
Supply and Demand
Price
Inflation
 Consumer Price Index
 Adjustments for inflation
Time value of money
 Discounting
 Net present value

Text Reading Chapter 4, except 4.1.

Assignment: Calculate the net present value of a stream of costs and benefits

Oct 7: Lecture 6:

- Optimal equilibrium prices
- Marginal Analysis
 - Marginal costs
 - Marginal revenue
- Production Possibility Frontiers: Guns and butter
- Opportunity Costs

Oct 9: Lecture 7: Costs and Costing

- Economic costs
- Costs and charges
- Direct Costs
- Indirect Costs

Text Reading: Chapter 4.1

Oct 11: Lecture 8: Cost of illness/ Burden of illness

- Natural history of an illness
- Variation in estimates of economic impact
- Need for greater precision

Oct 14: Lecture 9: Cost Minimization Analysis

- Comparison of alternatives with equal effect
- Standard for establishing equality of effect

Oct 16: Lecture 10: Cost Effectiveness Analysis

- Comparison of alternatives with outcomes in “natural units”

Text Reading: Chapter 5

Assignment: CEA for Pulmonary Embolism

Oct 18: Lecture 11: Decision Rules of CEA: Allocation of resources

- Dominance
- Extended dominance
- Incremental analysis
- Efficient frontiers

Assignment: Allocation of resources using ICERs

Oct 21: **Midquarter Examination: 50 minute**

- short answer questions with calculations
- Material from Lectures 1 to 11

Oct 23: Lecture 12: Decision Analysis
Decision making under uncertainty
Modeling
Decision tree structure
 Left to right flow, Time horizon
 Node types (choice, chance, terminal)
Expected value of outcome (rolling back a tree) DATA 3.5 software

Assignment: Create a decision tree, perform a roll-back.

Oct 25: Lecture 13: Sensitivity analysis
Purpose: test assumptions
 One-way
 Two-way
 Multi-way

Oct 28: Lecture 14: Markov models
State transition in health care
Parameters
 State definitions
 Initial probabilities
 Transition probabilities
 Cycle time
 Termination
Predicted life expectancy

Oct 30: Lecture 15: Markov models
Types
 Matrix
 Cohort
 Monte Carlo
Half cycle corrections

Nov 1: Lecture 16: Cost Utility Analysis
Quality adjusted life years
Sources of utility values

Text Reading: Chapter 6

Assignment:

In assigned groups, create a description of a patient with osteo-arthritis

Nov 4: Lecture 17: Preferences/utilities
SG, TTO, VAS

Nov 6: Lecture 18: Multi-attribute utilities
QWB, HUI2, EQ5D

Nov 8: Lecture 19: Health related quality of life
Validity and reliability
Generic instruments
Disease-specific instruments

Nov 11: ***Veteran's day, no class***

- Nov 13: Lecture 20: NEMC Short form Qs (Generic)
 SF-36, SF-12, SF-8
 Domains
 Questionnaire items/scoring
 Norms
Assignment: Respond to and score the SF-36
- Nov 15: Lecture 21: Sickness Impact Profile (Generic)
 Domains
 Questionnaire items/scoring
 Norms
Assignment: Respond to and score the SIP
- Nov 18: Lecture 22: AIMS2/WOMAC (Disease-specific)
 Domains
 Items/Scoring

Assignment: Respond to and score the AIMS2 and the WOMAC
- Nov 20: Lecture 23: AMCP Formulary Guidelines
 Procedure
 Economic elements
- Nov 22: Lecture 24: Actonel Markov Model: P&G
 Illustration of AMCP Guidelines in gaining formulary approval

Assignment: Review and answer questions about the Osteoporosis Markov Model
- Nov 25: Lecture 25: Health Alliance of Greater Cincinnati Drug Policy:
 Illustration of issues in pharmacoeconomics
 Cost Minimization
 Model building for expensive therapies
- Nov 27: Lecture 26: CEA in Medicaid: Oregon Plan
 Illustration of the complexity of rationale design
- Nov 29: ***University closed, Thanksgiving***
- Dec 2: Lecture 27: Pharmacoeconomic Guidelines
 Canada
 Australia
 Illustration of pharmacoeconomic data required for drug approval
- Dec 4: Lecture 28: US Panel on CEA
 Recommendations for reference case presentations in CEA
 Future of pharmacoeconomics
- Dec 6: Review for final examination
- Dec 9-15 (Exact date to come): ***Final examination:*** 120 minutes, cumulative from Lecture 1.