

First: Course Information

1	College: Pharmacy	2	Department: Pharmacy Practice
3	Academic Semester: Fifth Year – First Semester	4	Academic year: 1443 H
5	Course Name: Pharmacoepidemiology and Pharmacoconomics	6	Course code and number: PDPP0561
7	Number of credit hours: 2 Hours (...2... theoretical/lecture, ...0... training/tutorial)		
8	Course requirement in program: [<input checked="" type="checkbox"/>] Required (obligatory) [<input type="checkbox"/>] Optional (Elective)		
9	Course type: [<input type="checkbox"/>] University Requirement [<input checked="" type="checkbox"/>] College Requirement [<input type="checkbox"/>] Departmental Requirement		
10	Pre-requisite (code and number) (if applicable): -		

Second: Instructor Information

First: Course Information

1	Instructor's name: Dr. Yasser Alatawi		
2	Sections of the course that I teach – All sections in the Male section.		
3	Office phone number: 0144273022-3910	4	Mobile number (optional):
5	Office location and number: First Floor/ Department of Pharmacy Practice		
6	Office hours: Sunday, and Tuesday (1:00-3:00 pm)		
7	Website:		
8	E-mail: yasser@ut.edu.sa		

Second: Instructor Information

1	Instructor's name: Dr. Hoda Salem		
2	Sections of the course that I teach: All sections in the Female section.		
3	Office phone number: 0144273022-4045	4	Mobile number (optional):
5	Office location and number: First Floor (01-03-1-06)		
6	Office hours: Monday and Tuesdsy (1:00-3:00 pm)		
7	Website:		
8	E-mail: hsalem@ut.edu.sa		

Third: Lecture and lab timetables

Section	Days	Time	Place (Building/Room)
Male (1326 &1327)	Sunday	08:00 am –10:00 am	Faculty of Pharmacy/ 1st floor
Female (151)	Wednesday	9:00 pm-11:00 pm	Faculty of Medicine/ 1st floor

Fourth: Course description

Course description as found in the University Catalogue in English

The pharmacoepidemiology and pharmaco-economic course deals with the effects of the use of medication in populations and their quality of life. It introduces students to the evaluation of the studies that supports the rational use of drugs. The pharmaco-economic course emphasizes factors affecting the origin, organization, delivery and financing of health care in a community and its relation to pharmacy practice. The course deals with the impact of socio-economic factors and pharmaceutical industry actions on drug prescribing and consumption. Drug cost minimization, effectiveness and utility are analyzed, pharmaco-economic analysis and evidence-based medicine and using these data for making formulary decisions and set prices; and reference pricing in drug program management.

Fifth: General Objectives and Teaching Strategies

General course objectives (designate the sections and goals that are related to the course content)	Teaching strategies and instructional aids <ul style="list-style-type: none"> ● Traditional Lecture
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<p>Knowledge and Understanding</p> <ul style="list-style-type: none"> • Demonstrate the role of pharmacists in aspects of pharmacy-care according to legal, ethical and professional standards in promoting health as well as prevention and treatment. 	<ul style="list-style-type: none"> ● Demonstration ● Discussion ● PowerPoint
<p>Skills:</p> <ul style="list-style-type: none"> • Integrate pharmaceutical sciences with pharmacy applications according to legal, ethical, social, economic and professional guidelines. • Utilize effectively appropriate information technologies to optimize medication use and patient care. 	
<p>Values:</p> <ul style="list-style-type: none"> • Plan effective time management schedules, independent thinking and adaptation to changes or unanticipated circumstances 	

Sixth: Course or Curriculum units, subjects, specific objectives, and time schedule in the academic semester

Week number	Units	Instructional Objectives (Actions that prove the students adoption of specified behavior and achievement, learning outcomes, content)	Readings	Keywords
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	Unit Number	Unit/Chapter/Subject title		Reference Number	Pages	Key words
First	1	Introduction to Pharmacoepidemiology	<ol style="list-style-type: none"> 1. Define pharmacoepidemiology as it relates to pharmacy and public health 2. Explain the U.S. drug development and approval process, including its strengths and limitations 3. Identify two limitations of clinical trials and two limitations of spontaneous adverse event reporting in understanding drug use in a population 4. Describe the need for pharmacoepidemiology in health care system 5. Explain how health care databases have facilitated the growth of the pharmacoepidemiology discipline 6. Provide three practice-related questions of interest to pharmacoepidemiologists 7. List three ways in which pharmacists or public health practitioners can contribute to pharmacoepidemiology 	1.1	Chapter 1. Understanding Pharmacoepidemiology	Pharmacoepidemiology, spontaneous adverse event reporting, health care databases
Second	2	Study Designs for Pharmacoepidemiology	<ol style="list-style-type: none"> 1. Identify the general purposes of research 2. Discuss the important principles of study design 3. Distinguish between experimental, quasi-experimental, and observational approaches to 	1.2	Chapter 3. Understanding Pharmacoepidemiology	Study designs, experimental study, quasi-experimental

			<p>pharmacoepidemiologic research</p> <ol style="list-style-type: none"> 4. Describe various quasi-experimental study designs used in pharmacoepidemiology 5. Describe various observational study designs used in pharmacoepidemiology 6. Discuss the relative advantages and disadvantages of the various study designs 7. Describe the role of meta-analysis in pharmacoepidemiology 			<p>study, observational study</p>
Third	3	<p>Principles of Epidemiology Applied to the Study of Medication Use</p>	<ol style="list-style-type: none"> 1. Understand and calculate incidence and prevalence of a disease 2. Discuss the application of incidence and prevalence of diseases in pharmacoepidemiology 3. Understand and calculate various mortality measures 4. Discuss the application of mortality measures in pharmacoepidemiology 5. Understand and calculate risk ratio and odds ratio 6. Understand and calculate relative and absolute risk reduction, number needed to treat, and number needed to harm 7. Discuss the application of various association and effect measures in pharmacoepidemiology 	1.3	<p>Chapter 2. Understanding Pharmacoepide miology</p>	<p>Epidemiology measures, incidence, prevalence, mortality, risk ratio, odds ratio</p>
Fourth	4	<p>Biostatistics and</p>	<ol style="list-style-type: none"> 1. Explain what a variable is and differentiate 	1.4	<p>Chapter 5.</p>	

	Pharmacoepidemiology	<p>between an independent variable and a dependent variable</p> <ol style="list-style-type: none"> 2. Describe different approaches to classifying variables 3. Distinguish between descriptive and inferential statistics 4. Discuss different methods to summarize data and to describe the relationships between two variables 5. Distinguish between point estimation and interval estimation 6. Utilize key concepts related to hypothesis testing to arrive at statistical decisions and describe the relationship between hypothesis testing and confidence interval estimation 7. Discuss various statistical tests that can be used to describe the significance of group differences and appreciate the factors that are important in choosing an appropriate test 8. Describe how linear regression, logistic regression, and survival analysis (e.g., Cox regression) are used in pharmacoepidemiology and state the nature of the dependent variable as well as the commonly reported measure of association for each technique 9. Differentiate the concepts of confounding, 		Understanding Pharmacoepidemiology	Biostatistics, variables, descriptive statistics, Inferential statistics
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			mediation, and effect modification (interaction) 10. Appreciate the issues involved in estimating the sample size required for a pharmacoepidemiologic study			
Fifth	5	Common pitfalls in Pharmacoepidemiology studies	<ol style="list-style-type: none"> 1. Identify the nature of causation and association in pharmacoepidemiology studies 2. Describe the key criteria to determine causation 3. Identify the main types and sources of bias in pharmacoepidemiology studies 4. Explain the concept of confounding 5. Describe and discuss methods to deal with bias and confounding 6. Explain the concept of risk adjustment 7. Describe the methods for adjusting for risk in pharmacoepidemiology studies 	1.5	Chapter 6. Understanding Pharmacoepidemiology	Causation, association, Bias, confounding, risk adjustment
Sixth	6	Evaluation of the Pharmacoepidemiology Literature	<ol style="list-style-type: none"> 1. Understand the importance of critically evaluating the pharmacoepidemiology literature 2. Understand key topics in evaluating the pharmacoepidemiology literature 3. Apply checklist questions in evaluating the pharmacoepidemiology literature 	1.6	Chapter 7. Understanding Pharmacoepidemiology	Pharmacoepidemiology literature evaluation
Seventh	7	Introduction to Pharmacoeconomics	<ol style="list-style-type: none"> 1. Define Pharmacoeconomics. 2. Understand the importance and clinical relevancy of Pharmacoeconomics. 3. Understand the relationship of pharmacoeconomics to other disciplines. 	2.1	Chapter 1. Essentials of Pharmacoeconomics	Pharmacoeconomics

			4. List and describe the differences between the four most common types of pharmacoeconomics studies.			
Eighth	8	Measuring and Estimating Costs	<ol style="list-style-type: none"> 1. Define different costing terms. 2. Categorize types of costs. 3. Determine the perspective of a study based on types of costs measured. 4. Understand when adjusting for timing of costs is appropriate. 5. Calculate net present value. 6. Compare average costs with marginal or incremental costs. 7. List common sources for obtaining cost data. 	2.3	Chapter 2. Essentials of Pharmacoeconomics	Pharmacoeconomics, costs
Ninth	9	Types of Pharmacoeconomics Analysis: Part 1	<ol style="list-style-type: none"> 1. Define and describe cost-minimization analysis (CMA) and cost-effectiveness analysis (CEA). 2. Address advantages and disadvantages of CMA and CEA. 3. Discuss the different methods of presenting cost-effectiveness results. 4. Illustrate the use of a cost-effectiveness grid and a cost-effectiveness. 5. Compare intermediate- with final-outcome measurements. 6. Compare the terms “efficacy” and “effectiveness.” 7. Critique a CMA and CEA composite article. 	2.4	Chapter 4 and 5. Essentials of Pharmacoeconomics	Pharmacoeconomics, cost-minimization analysis, cost-effectiveness analysis
Tenth	10	Types of	1. Define and describe cost-utility analysis (CUA)	2.5	Chapter 6 and	Pharmacoeconom

		Pharmacoeconomics Analysis: Part 2	<p>and cost-benefit analysis (CBA).</p> <ol style="list-style-type: none"> 2. Address advantages and disadvantages of CUA. And CBA. 3. List the steps involved in measuring and calculating utility-based outcomes. 4. Compare the different methods used in estimating utilities. 5. Compare the different types of populations used to elicit utility estimates. 6. Compute quality-adjusted life-year (QALY) calculations. 7. Discuss the methods of measuring productivity and intangible costs, including the human capital (HC) and the willingness-to-pay (WTP) approaches. 8. Compare three types of calculation methods used with CBA: net benefits (or net costs), benefit-to-cost (or cost-to-benefit) ratios, and internal rate of return (IRR). 9. Critique a CUA composite article. 		7. Essentials of Pharmacoeconomics	ics, cost-utility analysis, cost-benefit analysis
Eleventh	11	Pharmacoeconomic modelling methods	<ol style="list-style-type: none"> 1. Give the definition and purpose of decision analysis. 2. List the steps for performing a decision analysis. 3. Draw a decision tree. 4. Calculate average costs and outcomes from a decision tree. 	2.6	Chapter 9. Essentials of Pharmacoeconomics	pharmacoeconomics, Decision analysis, decision, tree, Markov model

			<ol style="list-style-type: none"> 5. Interpret threshold analysis graphs. 6. Explain when Markov modeling may be useful. 7. List the steps in Markov modeling. 8. Interpret a pictorial representation of a Markov model. 9. Explain the advantages and disadvantages of Markov modeling. 			
Twelfth	12	Health-Related Quality of Life: Health Status Measures	<ol style="list-style-type: none"> 1. Define the term health-related quality of life (HRQoL). 2. Explain the importance of measuring HRQoL. 3. Compare and contrast the use of HRQoL (i.e., nonutility) measures with the use of direct elicitation utility measures (e.g., standard gamble, time tradeoff) and indirect elicitation preference-based classification systems (e.g., SF-6D, EQ-5D). 4. Compare and contrast generic measures with disease-specific measures. 5. Understand the methods for assessing the psychometric properties of HRQoL instruments, such as reliability, validity and responsiveness. 6. Give examples of common HRQoL measures and discuss their use in pharmacoeconomic research. 7. Give examples of common preference-based classification systems and discuss their use in pharmacoeconomic research. 8. Discuss the interest by the Food and Drug 	2.7	Chapter 8. Essentials of Pharmacoeconomics	Pharmacoeconomics, health-related quality of life, generic measures, disease-specific measures

			Administration (FDA) in patient-reported outcomes (PROs) and their relationship to HRQoL measures.			
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Seventh: Assessment and evaluation plan

Assessment tools	Date and duration (day/date/ time)	Subject matter covered in the exam	Type of questions	Grades out of 100	Guidelines and instructions
Calculation 1	Sixth week 6/10/2021 30 mins	Lectures 1-4	Calculations, case-solving problems	5 marks	Calculation and case study exam measuring all kinds of the student's skills with model answer from lecture notes and readings.
Midterm Exam	Eighth week 24/10/2021 90 mins	Lectures 1-6	MCQ, Short essays	30 marks	Multitask exam measuring all kinds of the student's skills with model answer from the lecture notes and readings.
Calculation 2	Fifteenth week 8/12/2021 30 mins	Lectures 6 -11	Calculations, case-solving problems	5 marks	Calculation and case study exam measuring all kinds of the student's skills with model answer from lecture notes and readings.
Final exam	Eighteenth week 26/12/2021	Lectures 1-12	MCQ, Short essays	50 marks	Multitask exam measuring all kinds of the student's skills with

	2 hours				model answer from the lecture notes and readings.
Evaluation without exam	Description of performance required from student	Due date	Rubrics	Marks	Guidelines & instructions
	The student has to evaluate a research article in pharmacoepidemiology or pharmacoconomics and criticize the assigned article	12/12/2021	Small group activity	10 marks	Students will be divided into groups. Each group will consist of 2 students will collaborate and participate.

Eighth: Readings and further References

1	Main Reference (Textbook) (correct citation in accordance to APA or other citation standards specific to discipline) From where student can get the textbook? <ol style="list-style-type: none"> 1. Pharmacoepidemiology Brian L. Storm, John wiley & sons ltd. 2. Pharmacoconomics: Principle and Practice, Lorenzo Pradelli and Albert Wertheimer. 3. Essentials of Pharmacoconomics by, Lippincott Williams & Wilkins.
Extra reading references and citations (books, internet cities, research papers)	
2	Pharmacoepidemiology and drug safety
3	PharmacoEconomics (Journal)

Ninth: The instructor's policy of dealing with students within the framework of the university laws, regulations, and guidelines.

1	Late attendance: Over 10 min delays will be considered absent.
2	Cheating and plagiarism: University rules will be applied.
3	Absences: University rules will be applied.
4	Late work policy: 5% of the activity mark will be reduced for each day delay.

5	Exiting during the lecture period: Allowed after permission.
6	Seating and student placement in the classrooms: Allowed any place in the lecture room.
7	Absence from an exam: University rules will be applied.
8	Mobile phone use in the classroom: The student will be considered absent.
9	Eating and drinking: Prohibited
10	Wearing uniform and apron in the class is mandatory