

PHRD 474: Endocrinology Module

I. Contact Information

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II. Course Prerequisites/Corequisites

CoEnrollment in PHRD 458 and

III. Course Description

This course will provide students with the appropriate pharmacologic, medicinal chemistry, pharmaceuticals, and therapeutic knowledge to appropriately select and monitor medication therapy for several endocrine disorders.

IV. Curricular Objectives and Outcomes

1. Provide Comprehensive Patient Specific Pharmaceutical Care
 - 1.A. Evaluate the appropriateness of a given prescription or medication order based on patient and disease-specific factors.
 - 1.A.i. Analyze the prescription regarding the medication, dose, delivery form, diagnosis, physical assessment for the patient and disease state.
 - 1.A.i.a. Collect patient-specific data regarding demographics, medical history, diagnosis, physical assessment, and medication history.
 - 1.A.i.a.2. Identify and collect pertinent information from the medical chart, database, and/or the patient/caregiver interview.
 - 1.A.i.a.2.c. Recognize appropriate patient- and drug-specific factors that will impact the drug regimen.
 - 1.A.i.b. Analyze and interpret information gathered to identify any drug-related problem.
 - 1.A.i.b.1. Assess the prescription for interaction potential, including interactions with other medications (both prescription and non-prescription), disease states, foods, and herbals.
 - 1.A.i.b.2. Determine availability and appropriateness of medications and dosage form. (pharmaceutics)
 - 1.A.i.b.3. Identify appropriate duration of therapy for that disease state.
 - 1.C. Develop and implement an evidence-based care plan.
 - 1.C.i. Identify goals of therapy that are individualized to the patient.
 - 1.C.ii. Develop a plan of care that includes interventions to resolve drug therapy problems, achieve the goals of therapy, and prevent drug therapy problems.
 - 1.C.iii. Develop a schedule to follow-up and evaluate the effectiveness of outcomes from drug therapies and assess any adverse events experienced by the patient.
 - 1.C.iv. Evaluate patient outcomes with respect to the achievement of goals of therapy, patient adherence, patient safety, and the development of new drug therapy problems.
 - 1.E. Document all activities involved with the provision of comprehensive patient specific pharmaceutical care.
 - 3.B.ii.i. Apply patient and population specific data, quality assurance strategies, and research processes to develop disease-specific treatment algorithms/pathways for a health care system.
 6. Think Critically.
 - 6.A. Identify, retrieve, understand, analyze, synthesize, and evaluate information needed to make informed, rational, and ethical decisions.
 - 6.A.i. Systematically gather, organize, and extract relevant information using a variety of methods and research tools.

- 6.A.ii. Analyze information within appropriate scientific, social, and clinical contexts.
- 6.A.ii.a. Identify principles of organization and the logic of arguments.
- 6.A.ii.b. Identify and test assumptions, biases, and prejudices implicit in arguments.
- 6.A.ii.c. Employ appropriate mathematical and statistical tools and electronic technology to analyze information.
- 6.A.ii.d. Assess accuracy, soundness, fairness, significance, relevance, completeness, and persuasiveness of information, arguments, and sources. (consider difference between information and the information source).
- 6.A.iii. Synthesize information in order to draw conclusions, hypothesize, conjecture alternatives, or plan a course of action.
- 6.A.iv. Evaluate conclusions and solutions according to appropriate criteria, and revise as necessary.
- 6.A.v. Provide support for rationale, solutions and results.
- 6.B. Solve complex problems that require an integration of one's ideas and values within a context of scientific, social, cultural, legal, clinical, and ethical issues.
- 6.B.i. Interpret problems within appropriate contexts.
- 6.B.ii. Prioritize problems based on identifiable criteria and standards.
- 6.B.iii. Apply systematic problem-solving strategies.
- 6.B.iv. Articulate and implement a defensible solution and apply appropriate criteria to monitor outcomes.
- 6.B.v. Implement modifications based on monitoring data.
- 6.C. Display habits, attitudes, and values associated with mature critical thinking.
- 6.C.i. Evaluate personal assumptions, biases, prejudices, and opinions.
- 6.C.ii. Display an openness to new ideas and a tolerance for ambiguity.
- 6.C.iii. Display inquisitiveness and commitment to the pursuit of truth.
- 6.C.iv. Adopt multiple perspectives in personal thinking to avoid ethno-centricity and intolerance.
- 7. Demonstrate Appropriate Interpersonal, Professional, and Ethical Behaviors.
- 7.C. Identify, analyze, and resolve ethical problems involved in pharmacy practice.
- 7.E. Collaborate proactively with other health care professionals.
- 7.G. Accept the responsibilities embodied in the principles of pharmaceutical care.
- 7.H. Demonstrate appropriate interpersonal, intergroup, and cross-cultural behaviors that promote respect and trust from peers, patients, and community members.

V. Course Specific Objectives and Outcomes

- At the conclusion of this course, students should be able to:
 - Demonstrate knowledge of the medicinal chemistry, pharmacological mechanism of action and related pharmaceutical topics of selected medications and medication classes used to treat endocrine disorders.
 - Identify appropriate non-pharmacologic therapy, based upon patient and disease specific information.
 - Develop appropriate pharmacotherapeutic regimes based upon patient and disease specific information.
 - Develop a plan for monitoring the pharmacotherapeutic regimen for efficacy, toxicity, and adverse effects.
 - Develop a plan for educating the patient regarding drug therapy.
 - Review a patient specific drug therapy regimen and make adjustments as necessary.
 - Promote health improvement, wellness and disease prevention in cooperation with patients, communities, at-risk populations and other members of an interprofessional team of health care providers.

VI. Course Topics

Pituitary Hormones and Disorders, Thyroid Hormones and Disorders, Adrenal Hormones and Disorders, Glucose Homeostasis, Diabetes Mellitus (Pharmacology, Medicinal Chemistry and Therapeutics)

VII. Instructional Methods and Activities

Instructional methods may include: traditional lectures, distance learning, in-class discussion of patient cases, small group discussions, problem-based learning, case-based learning, and individual projects.

VIII. Evaluation and Grade Assignment

- There will be three exams and a final exam, each encompassing new material and may include comprehensive material as well.
- Quizzes/assignments may be given, announced or unannounced, as deemed necessary by each faculty member. Quizzes will be added to the total points available for the course.
- Exam dates are scheduled in the course syllabus and will only be changed in the event of University closure.
- Exams may be multiple choice, fill in the blank, short-answer, case or scenario based discussion, essay, or any other format deemed necessary by the lecturers and course coordinator.
- Normal laboratory values will be provided for all questions, unless otherwise specified during class. Lab values that are specific to a particular disease state will not be provided.
- Information acquired from previous lectures in the course and from other courses in the professional pharmacy curriculum may be needed in preparing for these examinations.
- Exams will cover material (readings, outside assignments) not covered in class.
- Use of programmable calculators will not be allowed during quizzes or exams.
- Students wishing to review their exams with the course coordinator or with a specific lecturer must do so *within 2 weeks* of when the test scores are posted.
- In the event that a question is eliminated from an exam after it has been printed, the exam will be graded based on the remaining number of questions and adjusted to represent correct number of points.
 - Students wishing to challenge a question on the test must provide the course coordinator with a written statement that identifies which question(s) being challenged, why the student feels his or her answer(s) is/are correct and references from recent (published within the last 1-2 years) primary or tertiary literature to support the claim. Problems or issues with question(s) should be first directed, via e-mail, to the faculty member who presented the material. The course coordinator should be copied on this communication. In the event that the faculty member and the student cannot arrive at an acceptable conclusion, the course coordinator should be contacted regarding the issue. Discussion of a dispute will occur only after a written query is submitted. Challenges of test questions will only be considered *within 2 weeks* of when the test scores are posted.
- Individual test grades for the course will be based strictly upon these percentages. There will be no curving or adjustments of grades except in the case of an incorrect question.

Grading Scale:

89.5 – 100%	A
79.5 – 89.4%	B
69.5 – 79.4%	C
59.5 – 69.4%	D
≤59.4%	F

IX. Class Policies and Procedures

- TEXTBOOKS:**
1. Dipiro JT, Talbert RL, Yee G, et al. *Pharmacotherapy: A Pathophysiologic Approach*. 6th edition, New York, McGraw-Hill, Inc., 2005.
 2. Gibaldi's *Drug Delivery Systems in Pharmaceutical Care* by Archana Desai and Mary Lee. 2007, 1st Ed. ASHP. ISBN 978-1-58528-136-7.
 3. Goodman and Gilman's, *The Pharmacological Basis of Therapeutics*, Eleventh Edition, McGraw-Hill (editors, Brunton, Lazo and Parker).
 4. Thomas L. Lemke, David A. Williams. *Foye's Principles of Medicinal Chemistry*, 6th edition (2008) Walters Kluwer/Lippincott Williams & Wilkins; ISBN: 978-0-7817-6879-5.
 5. Additional reading materials may be posted on Moodle by course faculty.

ATTENDANCE POLICY: Class attendance is regarded as an obligation as well as a privilege, and students are expected to know attendance regulations and to attend regularly and punctually at classes in which they are enrolled. Failure to do so: (1) may prevent access to the classroom during regularly scheduled times; (2) may jeopardize a student's scholastic standing; and (3) may lead to suspension from the college or University. Students shall submit excuses for all class absences to professor within three class days after returning to classes. Professors shall accept an official University excuse. With the following exceptions professors are to determine whether absences are excused or unexcused: 1) Absences arising from authorized trips away from the University or from special duties at the University shall be excused. 2) Absences arising from a student's confinement in a hospital or other in-patient facility or doctor's excused absences shall be excused. Students are responsible for verifying this information to the faculty. 3) Absences arising from a death in the immediate family shall be excused. The immediate family is defined as spouse, child, step-child, mother, father, sister, brother, grandmother, grandfather, step-mother, step-father, step-brother, step-sister, aunt, uncle, mother-in-law or father-in-law.

MAKE-UP POLICY: Each student is expected to attend each exam at the date and time specified. If a student cannot attend an exam due to valid University excuse, he/she must speak directly with the course coordinator, as soon as possible. The course coordinator must be notified prior to the examination if a student misses the exam, if possible. Failure to attend a scheduled make-up exam will result in a zero (0) grade for that exam. Make-up exams will be prepared at the same or higher level than the original exam. The format of the make-up exam may be written or oral. *Students missing an exam due to a University approved excuse will take the make-up exam during the week of finals, or as determined by the course coordinator.*

ACADEMIC INTEGRITY: Students must observe the ULM published policy on academic dishonesty (See page 4 in the ULM *Student Policy Manual*: <http://www.ulm.edu/studentpolicy/>).

In addition, students must observe the ULM College of Pharmacy Code of Ethical and Professional Conduct (<http://rxweb.ulm.edu/pharmacy/policies/copcodeofconduct.pdf>) and the Dress Code (<http://rxweb.ulm.edu/pharmacy/studentinfo/default.html>).

COURSE EVALUATION POLICY: At a minimum, students are expected to complete the on-line course evaluation as well as any evaluation administered in class by the College of Pharmacy.

STUDENT SERVICES: Information about ULM student services, such as Student Success Center (<http://ulm.edu/cass/>), Counseling Center (<http://ulm.edu/counselingcenter/>), Special Needs (<http://ulm.edu/counselingcenter/special.htm>) and Student Health Services, is available at the following Student Services web site <http://ulm.edu/studentaffairs/>

FIRE EMERGENCY PLAN: Please check the emergency escape plan by the door of the classroom. Move quickly and orderly to the appropriate stair well and exit outside the building. **Under no circumstance is the elevator to be used for emergency fire evacuation.** Any student needing assistance with the stairs should notify the professor.

X. Tentative Course Schedule

Lectures 1-3: Introduction to endocrinology and Medicinal chemistry involved with prolactin, growth hormone, gonadotropins, androgens, estrogens, and posterior pituitary hormones

Lectures 4-8: Introduction to endocrinology and pharmacology of prolactin, growth hormone, gonadotropins, androgens, estrogens, and posterior pituitary hormones.

Lectures 9-11: Therapeutics of Pituitary Disorders (Acromegaly, Growth Hormone Deficiency, Hyperprolactinemia)

Lectures 12-13: Medicinal chemistry of thyroid and parathyroid hormones

Lectures 14-15: Pharmacology of thyroid and parathyroid hormones

Lectures 16-18: Therapeutics of Thyroid Disorders (Hyperthyroidism, Hypothyroidism) and parathyroid disorders

Lectures 19&20: Medicinal chemistry of Adrenal Hormones (ACTH/Mineralocorticoid Hormones and Glucocorticoid Hormones)

Lectures 21&22: Pharmacology of the hormones listed in lectures 18&19

Lectures 23-26: Therapeutics of Adrenal Gland Disorders (Cushing's Syndrome, Hyperaldosteronism, Addison's Disease, Adrenal Crisis, Glucocorticoid administration)

Lectures 27&28: Medicinal chemistry of Glucose Homeostasis and Hypoglycemic agents

Lectures 29&30: Pharmacology of Glucose Homeostasis and Hypoglycemic agents

Lectures 31-37: Therapeutics of Diabetes Mellitus, Diabetic Ketoacidosis/Hyperosmolar Hyperglycemic State, and Diabetic Complications

Lecture 38: Pharmaceutics related to the endocrinology module

There will be four tests worked into this schedule.