

PHL 362.01: Introduction to Contemporary Logic
 Dr. Frank Fair AB 4 402 Ph: 936-294-1509 Fax: 936-294-3798 email: psy_tkt@shsu.edu
 Office Hrs: MWF 9:00-10:50, TTH 9:30-10:50, and other times by appointment

CATALOGUE COURSE DESCRIPTION: PHL 362 Introduction to Contemporary Logic. Introduces the student to the principles of ordered thought and to the terminology and rules of symbolic logic. Discusses the logic of statements and the logic of predicates, quantifiers, and identity. Credit 3.

COURSE OBJECTIVES: (a) to acquaint students with modern first-order propositional logic and predicate logic, the background of all of today's programming languages, (b) to give students a thorough grasp of fundamental concepts of logic such as deductive validity, truth functions, and quantifiers, (c) to give students opportunities to practice the skills that are required to construct rigorous proofs, (d) to explore philosophical topics connected with logic such as the nature of truth and the power and the limits of proof,

TEXTS AND OTHER REQUIRED MATERIALS:

- (1) *Formal Logic: Its Scope and Limits* 4th edition by Richard Jeffrey
- (2) *Symbolic Logic* by Dale Jacquette

VERY IMPORTANT: The *Symbolic Logic* textbook comes with a CD for students. The *Logic Coach III Plus* gives feedback on attempted solutions for a number of the problems in the textbook. This is very important because getting feedback promptly promotes learning.

GRADING: The grading scale is: 90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, below 60 = F.

Exams: There will be four major exams plus a final exam. Each of the five exams will count 100 points for a total of 500. The exams will consist of problems modeled on those done in the homework and of questions that pose conceptual questions such as those requiring the definitions of key concepts. Each test is announced in advance and there will ordinarily be a class period set aside for review before each exam. The final average is a result of adding the point total for the exams to the point totals for the items described below and then dividing by 5 for the final average.

Homework: there will be a number of homework assignments that will each add one point to the overall point total for an assignment acceptably done. That means every problem attempted and turned in on time. **LATE OR INCOMPLETE WORK IS NOT ACCEPTED.** Assignments not done acceptably will subtract one point from the overall point total.

Class participation: there will be occasional extra credit for class participation, by asking informed questions and making informed comments, and by participating in problem solving on the blackboard. With regard to the latter, credit is one point for writing a proof on the blackboard and one point for discovering a flaw in a proof written on the blackboard.

ABSENCES: In accordance with University regulations, I will take roll every period. I make no use of the absence record in determining grades. However, if you do not attend class, you must drop the course before the deadline of Wednesday, October 10; otherwise, you will receive an F.

MAKE-UPS: I hate to give make-up exams. If I give one, it is likely to be longer and harder than the regular test since you would have more time to prepare for it. You must have valid reason for missing an exam. Another test the same day, for example, does not count. If you must miss a test, see me as soon as possible to let me know your reason for missing it. **YOUR EXCUSE MUST BE WRITTEN AND APPROPRIATELY DOCUMENTED. AN EXCUSE THAT DOES NOT WITHSTAND VERIFICATION WILL RESULT IN A GRADE OF ZERO FOR THAT EXAM.** If your excuse is valid, then we will make the necessary arrangements for you to take a make up exam as soon as possible.

STANDARD POLICIES: Each of these standard policies is stated in full on the Blackboard website for this course under Course Documents. I have extracted from the full statement a key element as a reminder of the policy in its entirety, but the student must download the posting on Blackboard to have the full policy statement. Here are the six standard policy matters: (1) NOTICE TO PERSONS WITH A DISABILITY: No accommodation can be made until you register with the Counseling Center. There will be no retroactive accommodations. (2) ACADEMIC DISHONESTY: Any student found guilty of dishonesty

in any phase of academic work will be subject to disciplinary action. (3) CLASSROOM RULES OF CONDUCT: Students are expected to assist in maintaining a classroom environment that is conducive to learning. (4) VISITORS IN THE CLASSROOM: It is at the instructor's discretion whether or not he/she will be allowed to remain. (5) ABSENCE ON RELIGIOUS HOLY DAYS: A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present in advance to each instructor involved a written statement concerning the religious holy day(s). (6) COURSE EVALUATIONS: In accordance with University policy, students will have an opportunity near the end of the semester on a set day and time to complete a course evaluation.

TENTATIVE SCHEDULE for PHL 362.01 CID# 4791 MWF 3:00-3:50 AB4 302 Fall 2007

August

Unit I: Basic Concepts of Deductive Logic, Identifying Arguments, Symbolizing Statements, and Constructing Truth Tables

Mon 20 Introduction to the course. The classical concept of deductive validity.

Wed 22 Read *Symbolic Logic* (SL) Chap. 1 Concepts of Logic pp. 1-26. Assignment #1:(Problems in Set II and Set III on pp. 48-50 NOTE: this is due to be turned in TODAY.)

Fri 24 Read SL Chap. 1 Concepts of Logic pp. 26- 47. Assignment #2: (Problem Sets IV and V pp. 50-53)

Mon 27 Read SL Chap. 2 Propositional Syntax and Semantics pp. 57-74 Assignment #3:(Problems sets II and III pp. 99-101)

Wed 29 Read SL Chap. 2 Propositional Syntax and Semantics pp. 74-98 Assignment #4:(Problems sets IV and V on pp. 101-106—DO ONLY THE EVEN NUMBERED PROBLEMS IN THE TWO SETS)

Fri 31 Read SL Chap. 3 Truth Tables pp. 108-127 Assignment #5:(Problem set II pp. 150-151)

September

Mon 3 Labor Day Holiday

Wed 5 Read SL Read Chap. 3 Truth Tables pp. 128-142 Assignment #6:(Problem sets III and IV on pp. 151-152 DO ONLY THE EVEN NUMBERED PROBLEMS IN BOTH SETS)

Fri 7 Read SL Chap. 3 Truth Tables pp. 143-149 and Read Jeffrey *Formal Logic: Its Scope and Limits* (FL) Chap. 1 Truth-Functional Logic pp. 1-18 Assignment #7:(FL 1.18 Problems 1, 2 ,3 , 7, 8, 9, 10, 11(a), 11 (b))

Mon 10 Review for First Exam

Wed 12 **FIRST EXAM—100 POINTS—1/5 OF FINAL GRADE**

REVISED SCHEDULE AS OF 9-12-07

Unit II: Proof Techniques In Propositional Logic

Fri 14 Read SL Chap. 4 Truth Trees pp. 154-174 Assignment #8:(4.1 p. 157 & 4.2 #1-#4 p. 174)

Mon 17 Read SL Chap. 4 Truth Trees pp. 174-190 Assignment #9:(4.3 #1-#3 p. 177 & II EVENS ONLY pp. 190-191. NOTE: Review the concepts in Exercise I on p. 190 but do NOT write them out.)

Wed 19 Read Jeffrey *Formal Logic* Chap. 2 Truth Trees pp. 21-34 Assignment #10:(2.6 Do Problems 2(a)-2 (d), 5(a), & 8)

Fri 21 Read SL Chap. 5 Propositional Natural Deduction Proofs pp. 194-214 Assignment #11:(5.1 p. 206 and 5.2 p. 214. IMPORTANT NOTE: Do NOT bother with truth trees and use any valid rules you can to solve these)

Mon 24 Read SL Chap. 5 Propositional Natural Deduction Proofs pp. 214-229 Assignment #12:(5.3 #1-#4 p. 219, 5.4 #1-#4 p. 225, & 5.5 #1-#4 p. 229. IMPORTANT NOTE: Do NOT bother with truth trees and use any valid rules you can to solve these)

Wed 26 Read SL Chap. 5 Propositional Natural Deduction Proofs pp. 229-242 Assignment #13:(5.6 p. 233 & 5.7 p. 239. IMPORTANT NOTE: Do NOT bother with truth trees and use any valid rules you can to solve these)

Fri 28 Review for Second Exam

October

Mon 1 Review for the Second Exam

Wed 3 **SECOND EXAM—100 POINTS—1/5 OF FINAL GRADE**

NOTE: UNIT III Schedule Revised 10—8-07

UNIT III Predicate Logic

Fri 5 Read SL Chap. 6 Predicate Syntax and Semantics pp. 259-271 Assignment #14:(Ex. 6.1, Ex. 6.2, and Ex. 6.3)

Mon 8 Read SL Chap. 6 Predicate Syntax and Semantics pp. 271-280 and a handout on the Square of Opposition. Assignment #15:(Ex. 6.5 Ex. 6.6)

Wed 10 **Last Day to Drop the Class.** Read SL Chap. 6 Predicate Syntax and Semantics pp. 280-288 and 300-303 Assignment #16:(Ex. 6.7 and Ex. 6.9)

Fri 12 Read Jeffrey FL Chap. 3 Generality pp. 35-48 Assignment #17:(pp. 48-49 #2, #3, #5, and #6)

Mon 15 Read Jeffrey FL Chap. 3 Generality pp. 49-57. Begin review for the Third Exam.

Wed 17 Review for Third Exam Assignment #18:(A handout of Natural Deduction problems)

Fri 19 Review for Third Exam Assignment #19:(A handout of Truth Tree problems and predicate logic symbolizing problems.)

Mon 22 **THIRD EXAM—100 POINTS—1/5 OF FINAL GRADE. NOTE: THE GRADE ON THIS EXAM MAY BE USED TO REPLACE THE GRADE ON THE SECOND EXAM.**

UNIT IV PROOFS IN PREDICATE LOGIC

Wed 24 Read SL Chap. 8 Predicate Natural Deduction Proofs pp. 364-372 Assignment #20:(Ex. 8.1 and 8.2)

Fri 26 Go over the Third Exam

Mon 29 Read SL Chap. 8 Predicate Natural Deduction Proofs pp. 373-382 Assignment #21:(Ex. 8.3 p. 372 and 8.4 p. 377)

Wed 31 Read SL Chap. 8 Predicate Natural Deduction Proofs pp. 383-394 Assignment #22:(Ex. 8.5 on p. 383)

November

Fri 2 Assignment #23:(Do Predicate Logic symbolizing problems from a handout.)

Mon 5 Assignment #24:(Do Natural Deduction problems in predicate logic from a handout.)

Wed 7 Review for the Fourth Exam. Assignment #25:(Do more Natural Deduction problems in predicate logic from a handout.)

Fri 9 **FOURTH EXAM—100 POINTS—1/5 OF FINAL GRADE**

Unit V Special Topics in Symbolic Logic

Mon 12 Jeffrey FL Chap. 4 Multiple Generality pp. 59-68 and Read SL Chap. 8 Predicate Natural Deduction Proofs pp. 420-425 on Relations

Wed 14 Jeffrey FL Chap. 4 Multiple Generality pp. 68-74.

Fri 16 Read Jeffrey FL Chap. 5 Identity pp. 75-83 and SL Chap. 8 pp. 425-427 Identity

Mon 19 Read Jeffrey FL Chap. 6 Functions pp. 85-97 and SL Chap. 8 427-430 Specific Numbers of Objects and Definite Descriptions

WEDNESDAY NOVEMBER 21--SUNDAY NOVEMBER 25 THANKSGIVING HOLIDAY

Mon 26 Read Jeffrey FL Chap. 7 Uncomputability pp. 99-112. Assignment #26:(A handout of problems involving the identity relation.)

Wed 28 *Symbolic Logic* Advanced Topics pp. 437-445 on Metatheory and Foundations of Mathematics (just to Peano's axioms) Assignment #27:(A handout of problems involving definite descriptions.)

Fri 30 Read Jeffrey FL Chap. 8 Undecidability pp. 113-123

December

Mon 3 Review for Final Exam Assignment #28:(a handout of problems from the whole semester)

Wed 5 **Last day of class.** Review for Final Exam. Assignment #29:(a handout of problems from the whole semester)

Fri 7 **Final Exam Study Day. No classes.**

Wed 12 5:00pm-7:00 pm **FINAL EXAM—100 points—1/5 OF FINAL GRADE**

NOTE: BECAUSE THE MATERIAL ON THE FINAL EXAM IS CUMULATIVE, THE FINAL EXAM GRADE CAN REPLACE THE LOWEST OF THE PREVIOUS FOUR EXAM GRADES.