

CURRICULUM PROPOSAL COVER SHEET  
University-Wide Undergraduate Curriculum Committee

LSC Use Only
Number _____
Action <u>Approved</u>
Date <u>1-19-89</u>

UWUCC Use Only
Number _____
Action _____
Date _____

I. TITLE/AUTHOR OF CHANGE

COURSE/PROGRAM TITLE PH 221 Introduction to Symbolic Logic  
DEPARTMENT Philosophy & Religious Studies  
CONTACT PERSON Dr. Dan Boone

II. THIS COURSE IS BEING PROPOSED FOR:

- Course Approval Only  
 Course Approval and Liberal Studies Approval  
 Liberal Studies Approval only (course previously has been approved by the University Senate)

III. APPROVALS

\_\_\_\_\_  
Department Curriculum Committee

\_\_\_\_\_  
Department Chairperson

\_\_\_\_\_  
College Curriculum Committee

\_\_\_\_\_  
College Dean\*

Chad D. Ashlock  
\_\_\_\_\_  
Director of Liberal Studies  
(where applicable)

\_\_\_\_\_  
Provost  
(where applicable)

\*College Dean must consult with Provost before approving curriculum changes. Approval by College Dean indicates that the proposed change is consistent with long range planning documents, that all requests for resources made as part of the proposal can be met, and that the proposal has the support of the university administration.

IV. TIMETABLE

Date Submitted  
to LSC \_\_\_\_\_  
to UWUCC \_\_\_\_\_

Semester/Year to be  
implemented \_\_\_\_\_

Date to be published  
in Catalog \_\_\_\_\_

## COURSE SYLLABUS

### I. CATALOG DESCRIPTION

PH 122 Introduction to Symbolic Logic 3 credits  
An introduction to fundamental concepts in deductive logic with an emphasis on teaching students the basis of clear logical thought. Some of the historical origins of logical theory are explored. Students learn to symbolize arguments in the truth-functional logic and the predicate logic. Ways of testing arguments for validity as well as proofs are covered, with a stressing of application to actual arguments drawn from numerous sources in the media, philosophical issues, and moral problems. No prerequisite.

### I. COURSE OBJECTIVES

1. Students learn to recognize the variety of logical structures that underlie arguments.
2. Students learn important evaluative concepts that apply to arguments such as "validity" and "soundness".
3. Students are taught through practice how to apply these evaluative concepts to arguments.
4. Students hone their critical thinking skills by applying the learned techniques of logical analysis to actual arguments from a variety of sources.

### III. TYPICAL COURSE OUTLINE: may vary somewhat with instructor

- A. The nature of reasoning.
  1. History of logic; contemporary issues in "critical thinking"
  2. Definition of Argument
  3. Deduction -- Induction distinction
  4. Truth, Validity, Soundness
- B. Truth-functional Logic
  1. History of truth-functional logic
  2. Truth operators defined
  3. Negation -- definition and symbolization
  4. Conjunction -- " " "
  5. Disjunction -- " " "
  6. Conditionals -- " " "
  7. Biconditionals -- " " "
  8. Truth table analysis
  9. Validity tests of arguments; numerous examples of arguments
  10. Proofs of arguments; numerous examples of arguments
- C. Predicate Logic
  1. History of categorical logic to modern predicate logic
  2. Predicates defined
  3. Variables and individuals
  4. Universal Quantifiers
  5. Existential Quantifiers
  6. Symbolization issues
  7. Validity tests of arguments; numerous examples of arguments
  8. Proofs of arguments; numerous examples of arguments

#### IV. EVALUATION METHODS

Actual methods of evaluation will vary from instructor to instructor, but all instructors will focus on testing the student's ability to analyze and evaluate actual arguments in written English form.

#### V. REQUIRED TEXTBOOKS

Will vary from instructor to instructor: many textbooks are available. Some possible texts are listed here:

Howard Kahane, Logic and Philosophy, 5th edition, Wadsworth, 1986.

Virginia Klenk, Understanding Symbolic Logic, Prentice-Hall, 1983.

Richard L. Purtill, A Logical Introduction to Philosophy,  
Prentice-Hall, 1989

Merrilee H. Salmon, Introduction to Logic and Critical Thinking,  
Harcourt, Brace, Jovanovich, 1984.

Recommended reading for the history of logic would be:

William and Martha Kneale, The Development of Logic, Oxford:  
Clarendon, 1962.

# LIBERAL STUDIES COURSE APPROVAL FORM

**About this form:** Use this form only if you wish to have a course included for Liberal Studies credit. The form is intended to assist you in developing your course to meet the university's Criteria for Liberal Studies, and to arrange your proposal in a standard order for consideration by the LSC and the UWUC. If you have questions, contact the Liberal Studies Office, 353 Sutton Hall; telephone, 357-5715.

**Do not** use this form for technical, professional, or pre-professional courses or for remedial courses, none of which is eligible for Liberal Studies. **Do not** use this form for sections of the synthesis course or for writing-intensive sections; different forms will be available for those.

## PART I. BASIC INFORMATION

**A. For which category(ies) are you proposing the course? Check all that apply.**

### LEARNING SKILLS

- First English Composition Course  
 Second English Composition Course  
 Mathematics

### KNOWLEDGE AREAS

- Humanities: History  
 Humanities: Philosophy/Religious Studies  
 Humanities: Literature  
 Fine Arts  
 Natural Sciences: Laboratory Course  
 Natural Sciences: Non-laboratory Course  
 Social Sciences  
 Health and Wellness  
 Non-Western Cultures  
 Liberal Studies Elective

**B. Are you requesting regular or provisional approval for this course?**

Regular       Provisional (limitations apply, see instructions)

**C. During the transition from General Education to Liberal Studies, should this course be listed as an approved substitute for a current General Education course, thus allowing it to meet any remaining General Education needs?**  yes       no

**If so, which General Education course(s)?** PH 221 Symbolic Logic I

It is the same course (though with some modifications to better meet LS goals and a changed title.)

**PART III. DOES YOUR COURSE MEET THE GENERAL CRITERIA FOR LIBERAL STUDIES?** Please attach answers to these questions.

- A. If this is a multiple-section, multiple-instructor course, there should be a basic equivalency (though not necessarily uniformity) among the sections in such things as objectives, content, assignments, and evaluation. Note: this should not be interpreted to mean that all professors must make the same assignments or teach the same way; departments are encouraged to develop their courses to allow the flexibility which contributes to imaginative, committed teaching and capitalizes on the strengths of individual faculty.

**What are the strategies that your department will use to assure that basic equivalency exists?** Examples might be the establishment of departmental guidelines, assignment of responsibility to a coordinating committee, exchange and discussion of individual instructor syllabi, periodic meetings among instructors, etc.

See explanation

- B. Liberal Studies courses must include the perspectives and contributions of ethnic and racial minorities and of women wherever appropriate to the subject matter. **If your attached syllabus does not make explicit that the course meets this criterion, please append an explanation of how it will.**

See explanation

- C. Liberal Studies courses must require the reading and use by students of at least one, but preferably more, substantial works of fiction or nonfiction (as distinguished from textbooks, anthologies, workbooks, or manuals). **Your attached syllabus must make explicit that the course meets this criterion.**

**[The only exception is for courses whose primary purpose is the development of higher level quantitative skills: such courses are encouraged to include such reading, but are not expected to do so at the expense of other course objectives. If you are exercising this exception, please justify here.]**

See explanation

- D. If this is an introductory course intended for a general student audience, it should be designed to reflect the reality that it may well be the only formal college instruction these students will have in that discipline, instead of being designed as the first course in a major sequence. That is, it should introduce the discipline to students rather than introduce students into the discipline. **If this is such an introductory course, how is it different from what is provided for beginning majors?**

See explanation

## CHECK LIST -- HUMANITIES: PHILOSOPHY

### Knowledge Area Criteria which the course must meet:

- Treat concepts, themes, and events in sufficient depth to enable students to appreciate the complexity, history, and current implications of what is being studied; and not be merely cursory coverages of lists of topics.
- Suggest the major intellectual questions/problems which interest practitioners of a discipline and explore critically the important theories and principles presented by the discipline.
- Allow students to understand and apply the methods of inquiry and vocabulary commonly used in the discipline.
- Encourage students to use and enhance, wherever possible, the composition and mathematics skills built in the Skill Areas of Liberal Studies.

### Philosophy Criteria which the course must meet:

- Introduce students to some of the great philosophers of Western civilization, avoiding excessive emphasis on one author or period of philosophical development.
- Introduce students to some or all of the major areas of philosophy (aesthetics, epistemology, ethics, and metaphysics). *Logic (omitted by mistake)*
- Courses which choose to emphasize one or more of these areas must do so in such a way as to show students the relationships among the various areas of philosophy.
- Alternately, courses which choose to approach these areas of philosophy historically by examining one or more of the recognized historical periods in philosophy (e. g. ancient/medieval, modern, or contemporary) must do so in such a way as to show students the contrasts and similarities with other periods.
- Provide opportunities, through the close analysis and evaluation of fundamental issues, for students to gain both an understanding of philosophy and an enhanced ability to think critically and responsibly about important issues.
- Investigate relationships with non-Western traditions and cultures where appropriate.
- Give due attention to the philosophical work of women and minorities.
- Use primary sources when feasible and appropriate.

Liberal Studies Course Approval Form Explanations  
PH 122 Introduction to Symbolic Logic

Part I. Please see items checked.

Part II. Liberal Studies Goals.

A. Intellectual Skills and Modes of Thinking

One primary goal to be met is category 1. Symbolic Logic addresses the essential nature of "abstract logical thinking" and "critical analysis." This and other logic courses offered by our department are the courses in which to learn these fundamental processes of logical thought. Another primary goal is category 3: Since mathematics often teaches logical principles in its courses, and logical theory is often regarded as part of mathematics, this course is also helpful in "understanding numerical data." Furthermore much of logical theory is applicable to areas of computer science; to the extent that some computer science concepts are regarded as "understanding numerical data" then to that extent so are logical concepts.

A goal which is borderline primary -- secondary is Category 2. Literacy. Learning to read or write critically and with effective argumentation, and to appraise the strength and weakness of encountered arguments is surely an important part of literacy. Through the course's concentration on teaching students to evaluate actual arguments, there will be enhancement of the students' abilities to carefully, and analytically read a passage, grasp the point (conclusion) of the passage, and not merely recognize but evaluate the strength of supporting statements.

Another secondary goal is a better appreciation of scientific inquiry. Part of scientific methodology involves deductive inferences, and deduction is a major idea examined in the course. Also, some attention is given to the nature of induction. Certain arguments examined may be drawn from scientific contexts as well.

A further secondary goal is an improvement in ethical thinking. Students will confront ethical issues in argument examples and thus learn to deal with ethical problems through appraisal, analysis, and deliberation, rather than mere reactive opinion. The student will thereby be given confidence that one may approach ethical problems in ways that enhance insight and understanding, rather than assume that values are dogmatically held and not open to change or discussion.

B. Acquiring a Body of Knowledge or Understanding Essential to an Educated Person

As a secondary goal, the course will contribute to a student's knowledge of the nature of human reasoning, and provide insight into the extent that human thought processes are or are not "logical". Further, the course will contribute to an understanding of the historical development of logical theory.

This knowledge becomes increasingly important for educated citizens in a computer-dominated culture. An understanding of basic logical functions covered in the course is important to understand certain aspects of computer technology.

PART III. General Criteria

A. Basic Equivalency

Basic equivalency of all sections of this course would be assured by the following process. All instructors who have taught this course during the previous academic year and summer or intend to teach the course the following academic year will meet at the conclusion of the spring semester. They will review this document, including the generic syllabus. They will exchange individual syllabi and then will discuss whether or not they are adequately meeting the specific goals and criteria approved for this course and outline herein. Any problems or conflicts would be brought to the attention of the entire department for resolution.

B. Perspectives and Contributions of Ethnic and Racial Minorities and of Women

It is possible that the instructor may choose a textbook authored by a woman (see titles on syllabus). Coverage of the history of the development of logic will make clear the contributions of minorities and women. Furthermore, certain argument examples evaluated may pertain to issues such as racism, sexism, and minority rights. Nonsexist and nonracist language will be used throughout the course, or pointed out and criticized when met with in examples.

C. Required Readings

For this course the department chooses to exercise the exception. As discussed earlier, the primary goals of this course are in the area of intellectual skills and modes of thinking. As such, numerous shorter passages and arguments need to be considered by the students. A longer work of (especially) non-fiction may contain arguments, and may even be overall a sustained argument about some central theme. However, to sacrifice so much class time in pursuit of the scattered arguments in a single source may not seem worthwhile. The student will not become acquainted with the broader range of diverse arguments and argumentative styles which can be found in shorter selections. This, however,



is a pedagogical judgment with which some instructors of the course may disagree. It is not without merit to focus on a "fairly large" major work and examine the arguments therein. It is especially true that certain philosophical works may be rich enough in arguments to warrant required use in this course, and this may be the choice of some instructors.

D. How This Course Differs From an Introductory Majors Course

First of all, there is no special course in our department designed to introduce our majors into the discipline. But even if there were, this proposed course would differ from such a course because of its totally different emphasis. The proposed course is designed to teach logical thinking and argument analysis over a wide range of both philosophical and non-philosophical topics with greater attention paid to the latter. A strictly Philosophy-oriented course would change that balance.

E. Six Ways of Contributing To Students' Abilities

1. Logical tools of thought apply to the thinking through of ethical problems too. To repeat what was said earlier, students will be presented with argument examples that raise a variety of ethical issues. Learning to apply logical techniques of analysis to such arguments will give the student the ability and confidence to really think about ethical problems rather than rely on snap judgments or "gut-level" feelings.
2. The critical thought processes of defining, analyzing, questioning, evaluating solutions, and making choices are all activities with a logical basis, and are exactly the kinds of activities directly addressed in this course.
3. The course contributes to the clarity of expression by honing a student's ability to argue and respond critically to the arguments of others. Effective writing and speaking requires that one have a good understanding of what makes arguments valid and sound.
4. Creative thought processes often involve criticism of the status quo or "accepted" solution, and reaching out into the space of logical possibilities for a solution yet untried. To some extent, training in logical principles may help in both the rejection of the all-too-obvious and stimulation of the imagination in looking for logical alternatives.
5. Logical skills of critical analysis should persist into later life, long past graduation, and should continue to improve a student's ability to learn, to think critically, to respond to issues thoughtfully and deliberately, and remain intellectually alive.

6. Since what many argument examples are taken from are "current issues, thought, institutions, and/or events" it follows that the student is naturally led to perceive the relationship between these and the subject material of this course.

#### Part IV. Specific Criteria for the Curriculum Category

##### Knowledge Area Criteria which the course must meet:

The course will cover the history of logic sufficiently to realize that modern symbolic logic represents the culmination of a long tradition filled with controversy, insights of genius, and intellectual high drama. Especially the 19th and 20th century developments from Frege through Russell, Gödel, and Turing deserve mention. The implications of these developments for broader philosophical issues in the nature of knowledge, science, and metaphysics will also be explored. This will both "enable students to appreciate the complexity, history, and current implications of what is being studied," and further "suggest the major intellectual questions....and principles presented by the discipline."

Since much of the course focusses on the application of logical methods of analysis to arguments (as has been described at length above) students are enabled "to understand and apply the methods of inquiry and vocabulary commonly used in the discipline." (The effects on literacy and composition skills has also been discussed above.) And because much of logical theory overlaps into mathematical theory there is a similar enhancement of mathematics skills.

Thus the extensive application of logical theory to real examples of arguments has several beneficial spin-offs, including helping the course to meet the general Knowledge Area Criteria.

##### Philosophy Criteria which the course must meet:

Through its coverage of the history of logic and through the use of examples of philosophical argumentation, the student will be introduced to some of the great philosophers of Western civilization.

Since logic is one of the major areas of philosophy, this requirement is met. Again, through addressing examples of logical argumentation in the other areas of philosophy, the concerns and relationships within philosophy will be explored. Examples of arguments which might be used by instructors to accomplish this are:

1. Plato: selected arguments from the following dialogues and related topics:  
Crito: civic responsibility

Theaetetus: nature of false belief

nature of knowledge

Republic: definitions of justice, gender equality

Euthyphro: ethics and God.

2. Aristotle: selected arguments from the Metaphysics, Nicomachean Ethics, Politics, and the logical works.
3. Anselm and Aquinas: arguments for God's existence
4. Descartes: arguments about skepticism and certainty  
arguments about the relationship of mind and  
body
5. Hume: arguments about causality, induction, free will and  
determinism
6. Kant: ethical arguments about the nature of goodness. the  
nature of knowledge. The analytic-synthetic  
distinction.

This kind of use of argument examples will also satisfy the requirement that the course "provide opportunities, through the close analysis and evaluation of fundamental issues, for students....to think critically and responsibly about important issues." These will also be primary sources.

The history of logic coverage will discuss developments in China and India and will point out contributions of women and minorities where appropriate.