

University of California, Santa Barbara | Semester Year

**COURSE CODE**

# Modern Logic

Day Time | Classroom

**INSTRUCTOR:**

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Office | Office Hours

**COURSE DESCRIPTION**

Logic is the study ways in which arguments can be good or bad in virtue of their form. In this course, we will discuss some common patterns of good and bad arguments and basic tools to evaluate arguments. We will learn two artificial languages, sentential logic and predicate logic to evaluate arguments that are good in virtue of occurrences of specific expression, respectively: “and”, “or”, “not”, etc; and “all”, “each”, “some”, “none”, etc. We will begin by learning how to translate arguments from natural language (English, Portuguese, Spanish, etc.) to an artificial language, followed by the semantics of the artificial languages. Then we will learn two methods of evaluating the quality of an argument: truth-tables and natural deduction.

**LEARNING OBJECTIVES AND STUDENT OUTCOMES**

- Know the artificial languages of sentence and predicate logic and be able to translate sentences from English to these artificial languages;
- Evaluate the quality of arguments by means of truth-tables and natural deduction;
- Develop critical thinking skills that can be carried over to other fields.

## COURSE REQUIREMENTS

- 20% Midterm Exam 1
- 20% Midterm Exam 2
- 20% Research Project – self-chosen topic
- 30% Final Exam – cumulative
- 10% Participation

### *Midterm Exams 1 & 2 and Final Exam*

Midterm Exams 1 & 2 will be in-class, on week 5 & 10. Final Exam will be on the scheduled finals week.

### *Research Project – self-chosen topic*

When translating sentences from natural languages to sentential and predicate logic, you'll see that artificial languages do not capture all aspects of the meaning of natural languages, and sometimes we have counter-intuitive results. Your Research Project should be about one of these cases. Throughout the course, I will give specific cases, but you are welcome to research about a case that interests you even if I don't explicit mention it. For full credit, students have to (1) submit a short report (2–3 pages), (2) give an in class presentation, and (3) ask questions in other presentations. For the presentation part, I encourage you to get as creative as you want; for instance, you can for a group for a theatrical performance, you may write and sing a song/poem, you can make a short video, and so on and so forth. You are required to get instructor's approval both for your topic and presentation form.

### *Participation*

Participation grade will be based on student's engagement in lecture and participation on in class activities throughout the course. Attendance will be taken but do not expect a perfect grade merely for being an organic body.

### *Homework*

Homework will be assigned in each class. It won't be graded, however, I strongly encourage you to do all homework exercises. The purpose of the class is to teach you a skill, and mastering any skill requires a lot of practice.

**NOTE:** Things change – the Fates are fickle. Information found on this syllabus is subject to revision as we progress through the quarter: Readings and content may be

added (or cut) depending on our rate of progress, and it may be necessary to amend the due date of the assignments. Revisions will be announced in lecture and posted online. It is each student's responsibility to keep informed of any changes.

## MATERIALS

Paul Teller, *A Modern Formal Logic Primer*, Volume I and II.

\*\* The textbook is freely available at <http://tellerprimer.ucdavis.edu/>. \*\*

Students are expected to have done the readings *before* lecture.

## COURSE SCHEDULE & READINGS

**WEEK 1:** *Volume I, Chapter 1: Basic Ideas and Tools.*

**WEEK 2:** *Volume I, Chapter 2: Transcription between English and Sentence Logic.*

### **WEEK 3**

- Volume I, Chapter 3: Logical Equivalence, Logical Truths, and Contradictions.
- Volume I, Chapter 4: Validity and Conditionals.

### **WEEK 4**

- Practice exercises.
- Midterm 1 Review.

### **WEEK 5**

- Midterm Exam 1.
- Volume I, Chapter 5: Natural Deduction for Sentence Logic – Fundamentals.

### **WEEK 6**

- Volume I, Chapter 6: Natural Deduction for Sentence Logic – Strategies.
- Volume I, Chapter 7: Natural Deduction for Sentence Logic – Derived Rules and Derivations without Premises.

### **WEEK 7**

- Practice exercises.
- Volume II, Chapter 1: Predicate Logic Syntax.

**WEEK 8**

- Volume II, Chapter 2: Predicate Logic – Semantics and Validity.
- Volume II, Chapter 3: More about Quantifiers.

**WEEK 9**

- Volume II, Chapter 4: Transcription.
- Midterm 2 Review.

**WEEK 10**

- Midterm Exam 2.
- Volume II, Chapter 5: Natural Deduction for Predicate Logic.

**WEEK 11:** *Volume II, Chapter 6: More on Natural Deduction for Predicate Logic.*

**WEEK 12:** *Practice Exercises*

**WEEK 13:** *Presentations.*

**WEEK 14**

- Presentations.
- Final Review.

**GRADING**

The usual grading scale will apply: 0-59% F, 60-62% D-, 63-66% D, 67-69% D+, 70-72% C-, 73-76% C, 77-79% C+, 80-82% B-, 83-86% B, 87-89% B+, 90-92% A-, 93-96% A, 97-100% A+.

Written work will be graded based on the following **six** evaluation criteria:

**Bare minimum:** is the paper prompt or question addressed at all?

**Clarity:** Are the explanations of technical terms and arguments clear, understandable, and accessible to someone who is not taking the class?

**Correctness:** Are the explanations of technical terms, theories and arguments correct? Are the theories and arguments ascribed to the right philosophers?

**Originality:** Are there original cases, objections, or replies?

**Relevance:** Are there information, theses, cases, or arguments that are irrelevant to address the prompt? Is the paper lacking explanation of a relevant theory, thesis, case, or argument?

**Structure:** Does the paper have a clear structure, with introduction and conclusion? Are the theses, cases, and arguments presented in an organized way?

**NOTE:** While there is no evaluation criterion for grammar or typos, they may affect the grade if they are severe enough to compromise understanding. So, before submitting your paper or take home exam, make sure to ask a friend to proof read besides proof reading the paper yourself. Also take note of campus resources listed below that offer assistance with essay-writing.

## ACADEMIC INTEGRITY

I take academic dishonesty in any form very seriously: I will prosecute any offenses, seeking penalties ranging up to and including expulsion from the university. The university's Academic guide to Integrity is available online: <http://judicialaffairs.sa.ucsb.edu/PDF/academicintegflyer.pdf>. It is every student's responsibility to be familiar with the university's policies. If you see anything there that you don't understand please contact me.

## STUDENT SUPPORT AND CAMPUS RESOURCES

If you are facing a major medical or another major difficulty that is keeping you from doing well in the class, contact me as soon as you can. I am happy to work with you to find the best course of action and, if possible, to help you complete the course successfully. But I can't help if you don't let me know about your circumstances as soon as they arise.

\*\* Please, don't wait until after the final exam to let me know about your circumstances. At that point there is virtually nothing we can do to accommodate you.\*\*

### *1) CAPS (Counseling & Psychological Services)*

If you're dealing with depression, anxiety, or are just feeling overwhelmed, CAPS is available to help. They offer individual and group counseling, as well as relaxation rooms and other resources to make the quarter more bearable.

- (805) 893-4411
- <http://counseling.sa.ucsb.edu>

2) **CARE** (*Campus Advocacy Resources & Education*)

CARE provides resources related to sexual assault, stalking, and intimate partner violence. They offer free and confidential counseling, medical and legal assistance, and help with referrals for long-term support for those who need it.

- (805) 893-4613
- <http://wgse.sa.ucsb.edu/Care>

3) **RCSGD** (*Resource Center for Sexual and Gender Diversity*)

The RCSGD provides resources for gender, sexual, romantic minorities such as: lesbian, gay, bisexual, transgender, asexual, intersex, and otherwise gender/sexual/romantic nonconforming individuals.

They also collect reports of hate incidents and maintain a list of gender neutral bathrooms on campus.

- (805) 893-5847
- <http://wgse.sa.ucsb.edu/sgd/>

4) **CLAS** (*Campus Learning Assistance Services*)

CLAS offers workshops on study skills like note-taking and time management; group tutorials on math, science, and economics; assistance with essay-writing, and other free services that will help you perform well in your classes.

- <http://clas.sa.ucsb.edu>

5) **DSP** (*Disabled Students Program*)

If you have any sort of disability - physical or mental, permanent or temporary – we strongly encourage you to register with DSP. They can then notify your instructors if you need certain accommodations during classes or during tests.

A disability can be something like difficulty seeing or hearing; difficulty attending class due to physical or emotional distress; chronic anxiety or depression; or anything else that interferes with your schoolwork.

There's no shame in seeking help for these sorts of things, but unfortunately UCSB requires that instructors receive confirmation from DSP before providing accommodation. Since DSP is often busy, contact them as soon as possible if you need or expect to need their support.

- (805) 893-2668
- <http://dsp.sa.ucsb.edu>