

**San José State University
Department of Philosophy**

**PHIL 009 – Mathematics and Logic for General Education
Fall Semester 2018**

Course and Contact Information

Instructor:	Noah Friedman-Biglin
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Office Location:	Faculty Offices Building, Room 207
Office Hours:	Mondays, from 3 30 – 5 00 PM Fridays, from 3 – 4 PM
Class Days/Time:	Monday and Wednesday, 12 PM – 1 15 PM
Classroom:	Sweeney Hall, Room 241

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Faculty Web Page and MYSJSU Messaging

This course will make use of the Canvas course management system. You are responsible for regularly checking with the messaging system through MySJSU (or other communication system as indicated by me) to learn of any updates.

Course Description

A survey of basic concepts and methods in logic, focusing on mathematical logic, and formal proof. Some emphasis will be placed on using these concepts in daily life and in coping with public issues.

GE Area: B4

Prerequisite: satisfaction of ELM requirement.

The mathematical concepts course should prepare the student to:

1. use mathematical methods to solve quantitative problems, including those presented in verbal form;
2. use mathematics to solve real life problems; and
3. arrive at conclusions based on numerical and graphical data.

Learning Outcomes and Course Goals

Upon successful completion of this course, students will be able to:

- Be able to translate arguments from natural language into *formal notation* using the appropriate *logical connectives* and *quantifiers*;
- Be proficient in the use of *truth-tables* to determine *validity*;
- Be proficient with the *lemmon-style natural deduction system* for *propositional logic*.

Required Texts/Readings

Textbook

Tomassi, Paul. *Logic*.
Blackwell Publishing, Inc.
ISBN: 0-415-16695-9

Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

There are four parts to your assessment in this course: logic exercises (40%), a midterm examination (20%), the final exam (35%), and class participation (5%).

- Exercises are due *in class every Wednesday, unless otherwise listed on the course schedule*. They can be either typed or hand-written, but if hand-written they must be done *legibly* (no points will be awarded for exercises I cannot read). *You must write your full name on the top of each page* – I cannot award you points if I do not know the work is yours.
- The midterm will cover translations from natural language into formal logic, truth-tables, natural deduction, and semantic trees. You will not need a test booklet (“green book”) for the midterm – I will provide one for you.
- The final exam will be cumulative. The problems may cover any area, including translations, natural deduction, truth-tables, semantic trees, translations with quantifiers, and relations. I will hold a review session in the week before the exam, during which there will be an opportunity to ask questions and go over any material from the course you may wish. You will not need a test booklet (“green book”) for the final – I will provide one for you.

Determination of Grades

- Grades will be determined according to the rubric above. Intermediate grades will be used (that is, grades using + and –) according to the following formula:
 1. 100 – 98: A+
 2. 97 – 94: A
 3. 93 – 90: A–
 4. and so on ...

Classroom Protocol

- *All work is due when it's due*. No late work will be accepted.
- *Attendance is required*. Missing more than two classes in a semester may result in a lowered grade. Please stay in touch if you have a medical issue, family emergency, or work responsibility that makes attendance impossible. You are responsible for completing the work whether you are in class or not. You are also responsible for finding out whether there were any changes to the assignments on the syllabus. Please ask a classmate for this information.
- If you believe that there has been a mistake in *calculating* your grade, please contact me. However, any emails sent where you either (1) simply disagree with a mark I have given you, or (2) are asking me to round or otherwise alter your grade will not be dignified with an answer.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on the Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

Course Schedule

Week	Date	Topics, Readings, Assignments
1	8/22	Introducing Formal Logic: Arguments Read: ch. 1
2	8/27	Introduction to Formal Logic: Translations Read: sections I, II, and III of ch. 2
2	8/29	Introduction to Formal Logic: Translations Read: sections I, II, and III of ch. 2 Due: Exercise 1.1, Questions 1 – 5 Due: Syllabus Quiz
3	9/3	No Class – Labor Day
3	9/5	Introduction to Formal Logic: Truth-tables Read: ch. 4, sections I – VI Due: Exercise 2.1 (1 – 3 only) and all of 2.2
4	9/10	Introduction to Formal Logic: Truth-tables Read: ch. 4, sections VII – IX
4	9/12	Introduction to Natural Deduction (&I, &E) Read: ch. 2, sections IV – X Due: Exercise 4.1 (1 – 10 Only), and 4.3 (1 – 10 Only)
5	9/17	Natural Deduction (CP) Read: sections IV through X of ch. 2
5	9/19	Natural Deduction (MT, DNE) Read: ch. 3, sections I – III Due: Exercise 2.3 (question 2, #1 – 5 only), 2.4 (question 1, #1 – 4), and 2.5 (question 1, #6 – 10 only)
6	9/24	Review Day – Natural Deduction
6	9/26	Natural Deduction (\vee I) Read: ch. 3, sections I – III Due: All of 3.1, 3.2 (questions 1, 3, 5, 7 only)
7	10/1	Natural Deduction (\vee E) Read: ch. 3, sections IV, V, and VI
7	10/3	Natural Deduction (RAA) Read: ch. 3, section VII Due: Exercise 3.4 (question 2, numbers 1 – 4), and all of 3.5
8	10/8	Natural Deduction (Golden Rule)

Week	Date	Topics, Readings, Assignments
		Read: ch. 3, section VI
8	10/10	Review Day Due: Exercise 3.9 (question 1, numbers 1 – 10)
9	10/15	Mid-Term Examination
9	10/22	Semantic Trees Read: ch.4, sections X – XI
10	10/24	Semantic Trees Read: ch.4, sections X – XI
10	10/29	Quantifiers and Predicate Logic: Translations Read: ch. 5, section I – VI Due: Exercise 4.6 (all), and 4.7 (numbers 1 – 10 only)
11	10/31	Quantifiers and Predicate Logic: Translations Read: ch. 5, section I – VI
11	11/5	Introduction to First Order Logic (FOL): Relations Read: ch. 5, sections VII – X Due: All of exercise 5.3
12	11/7	Introduction to First Order Logic (FOL): Relations Read: ch. 5, sections VII – X
12	11/12	No Class – Veteran's Day
13	11/14	FOL: Equivalence Relations and Identity Read: ch. 5, sections XI – XIII Due: Exercise 5.7, Question 1 (i – x only)
13	11/19	FOL: Equivalence Relations and Identity Read: ch. 5, sections XI – XII
14	11/21	No Class – Thanksgiving
14	11/26	FOL: Numerically Definite Quantification Read: ch. 5, Section XIII
15	11/28	Semantic Trees for Quantified Logic Read: ch. 7, sections I and II Due: Exercise 5.8, question 3 (i – vi)
15	12/3	Semantic Trees for Quantified Logic Read: ch.7, sections I and II
16	12/5	The Incompleteability of FOL Due: Exercise 7.1, question 1 (1 – 5)
16	12/10	Final Exam Review Day
Final Exam	12/13	Exam from 9 45 am – 12 00 pm; Exam Room: Sweeney Hall, 241