Official Syllabus
PHIL/MATH/CS 4/51038: Intermediate Logic
Fall 2019: TR 12:30-1:45

Professor of Philosophy, Deborah C. Smith
Office: Bowman 320K (672-0275)
Email: dcsmith1@kent.edu
Office Hours: T 11:30-12:30, TR 1:45-3:45, and by appointment

Attendance Policy: I will hand out a sign-up sheet or otherwise take note of those present at the beginning of class. You are responsible for all material covered in lecture whether or not it is explicitly covered in the readings. While there are no explicit points toward the final grade for attendance and participation, both will factor into my decision concerning, e.g., whether to give a borderline student an A- or a B+.

Final: The final exam will largely focus on the material covered since the last midterm and on which you have not previously been tested. The final exam will be worth 20% of your final grade in the class.

For more information about course content and requirements, see the course content handout.

Official Statements:

Students with Disabilities: University policy 3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

Academic Complaints: The Philosophy Department Grievance Procedure for handling student grievances is in conformity with the Student Academic Complaint Policy and Procedures set down as University Policy 3342-16 in the University Policy Register. For information concerning the details of the grievance procedure, please see the departmental chairperson.

Academic Dishonesty: University policy 3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy at http://www.kent.edu/policyreg/policydetails.cfm?customel_datapageid_1976529=2037779.
Intermediate Logic (PHIL/CS/MATH 4/51038)
Deborah (Dr. Deb) Smith,
Professor of Philosophy

Fall, 2019
TR 12:30-1:45

Office: Bowman 320K
Phone: Office: 672-0275
       Phil. Dept.: 672-2315
Email: dcsmith1@kent.edu
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http://www.kent.edu/philosophy

Required Texts and Readings:
   John Nolt, Logics (Revised and Updated 2015)
   Course Handouts

This course is a detailed, systematic study of symbolic logic for philosophy majors, mathematics majors, computer science majors, and anyone else interested in advanced study in logic. The aim of the course is twofold: first, to develop a facility in understanding and using symbolic logic for various purposes, and second, to understand and appreciate symbolic logic as an area of study in itself. Topics will include the definition of a well-formed formula, the syntax/semantics distinction, the distinction between object-level (syntactic) and meta-level (semantic) proofs, the distinction between axiomatic systems and natural deduction systems of object-level proofs, the differences between rules of proof construction which are replacement rules, those which are reiteration rules, and those which are neither, and the soundness, completeness, and undecidability of the predicate calculus. Although the language of first-order predicate calculus will be our main focus, we will also explore various ways to enrich the language with identity, function symbols, and with modal operators. Time permitting, we will also examine the motivations for and details of various non-classical logics.

NOTICE OF MY COPYRIGHT AND INTELLECTUAL PROPERTY RIGHTS.
Any intellectual property displayed or distributed to students during this course (including but not limited to powerpoints, notes, quizzes, examinations) by the professor remains the intellectual property of the professor. This means that the student may not distribute, publish or provide such intellectual property to any other person or entity for any reason, commercial or otherwise, without the express written permission of the professor.
Course Requirements:

Reading:
- You are to have completed the assigned reading before class on the day for which it is assigned.
- Most of the reading assignments are listed in the Schedule of Readings and Assignments below, although I may add some additional reading assignments.
- The material we will be reading in this course is dense and can be quite technical. Expect to spend a relatively long time doing the reading.
- You should read the assigned material at least twice (once before we discuss it in class and once after) to make sure that you understand it.
- It is highly recommended that you take notes on the reading and write down any questions you have so that I can answer them in class.
- You are responsible for all material covered in the assigned readings whether or not it is explicitly covered in class.
- You are expected to bring all relevant reading materials with you (including relevant handouts) to class.

Attendance:
- Attendance in this class is crucial, as it can be very difficult to pick up this material on your own. In order to motivate you to come to class regularly, I will hand out a sign-up sheet or otherwise take note of those present at the beginning of class.
- Do not make a habit of coming to class late or leaving early. This is not only disruptive to the other students, but may also cause you to miss an important part of the lecture.
- It is worth noting that mere attendance is not sufficient for success in this class; it is also extremely important that you ask questions when you have them or let me know when something I have said makes little or no sense to you.
- Make sure that phones and other electronic devices are turned off prior to the start of class. Tablets or lap tops should be used only for the purpose of taking notes.
- Unless you have received my explicit permission to do so, refrain from recording the lecture in any way.
- If, for any reason, you cannot avoid missing a class meeting, it is your responsibility to contact me before the class so that we can arrange for you to make up any assignments scheduled for that day. I also highly recommend that you borrow lecture notes from a classmate should you miss a class.
- You are responsible for all material covered in lecture whether or not it is explicitly covered in the readings.
Graded Material for Phil/Math/CS 41038:

Homework Assignments:
- There will be 12 homework assignments each worth 20 points.
- Problems will be handed out approximately one week in advance of the due date.
- Due dates for each are listed in the syllabus.
- Unexcused, late homework will be docked 5 points if handed in one class day late and will not be accepted for credit afterward.

Exams:
- There will be two unit exams and a comprehensive final each worth 120 points.
- The unit exams will likely be take-home exams handed out approximately one week in advance of the due date.
- Due dates for each are listed in the Schedule of Readings and Assignments below.
- Late take-home exams will not be accepted.
- The comprehensive final will be a closed book, closed note exam given in class on the date scheduled for the final.

Graded Material for Phil/Math/CS 51038:
The graded material for the 51045 course consists of a super set of the graded material for the 41038 course (see the above description). The differences and additions are as follows:

- **Reading:** in at least a few cases, reading that is merely recommended for students in 41038 will be required of students in 51038. These additional required readings are clearly marked in the schedule of readings and assignments.
- **Homework:** in at least a few cases, students in 51038 can expect slightly different homework questions (usually more challenging ones) than those given to 41038 students.
- **Unit Exams and Final Exam:** there will be a great deal of overlap between the exams for 41038 and those for 51038. However there will be additional exam questions on material covered by the readings for students in 51038.

Grades and Grading:
Final grades will be based on the curve determined by the 600 possible points and influenced somewhat by the standard scale where 90-100%=A range, 80-89%=B range, 70-79%=C range, 60-69%=D range, and 0-59%=F.

While there are no explicit points toward the final grade for attendance and participation, both will factor into my decision concerning, e.g., whether to give a borderline student an A- or a B+.

**There are no extra credit points available.** Come see me during office hours or schedule an appointment as soon as you feel that you are having difficulty with any of the course material.
Schedule of Readings and Assignments:
(This schedule is tentative. You are responsible for knowing about any changes announced in class.)

Week 0:
R   *Introductions and Preliminaries*
    **Reading:** *Logics*, Chapter 1

PROPOSITIONAL CALCULUS:

Week 1:
T   *Basic Syntax and Semantics*
    **Reading:** Chapter 2 and 3.1
    **Homework 1** (see handout): Due Tuesday of Week 2

R   *Primitive Rules of Derivation*
    **Reading 51038:** Chapter 5.1 (see the definition of ‘consistent’ on p. 59)

Week 2:
T   *Continue Primitive Rules of Derivation*
    **Reading:** Chapter 4.1-4.3
    **Homework 2** (see handout): Due Thursday of Week 3

R   *Complex Strategies for Derivations*
    **Reading 51038:** Chapter 5.2-5.4

Week 3:
T   *Theorems and Derived Rules*
    **Reading:** Chapter 4.4-4.5
    **Homework 3** (see handout): Due Thursday of Week 4

R   *Continue Theorems and Derived rules; Alternative Proof Techniques (time permitting)*
    **Reading 51038:** Chapter 5.5 and 5.6

Week 4:
T   *Valuation Rules and Decision Procedures*
    **Reading:** Chapter 3
Week 4 continued:

R Continue Decision Procedures
Reading 51038: Chapter 5.7-5.10
Homework 4 (see handout): Due Tuesday of Week 5
Take home exam 1: Handed Out—Due in class on Tuesday, October 1st

Week 5:

T Catch-up and Review

FIRST ORDER PREDICATE CALCULUS WITH IDENTITY

R Formation Rules
Reading: Chapter 6
Reading 51038: Chapter 9.4
Homework 5 (see handout): Due Thursday of Week 6

Week 6:

T Continue Formation Rules; Primitive Quantificational Rules of Derivation
Reading: Chapter 8.1-8.4
Take home exam 1: Due Today

R Continue Primitive Quantificational Rules of Derivation
Reading 51038: Chapter 10.1-10.2

Week 7:

T Continue Primitive Quantificational Rules of Derivation; Rules Governing the Identity Predicate and Function Symbols
Reading: Chapter 8.5-8.6
Homework 6 (see handout): Due Tuesday of Week 8

R No Class Thursday, October 10: Fall Break

Week 8:

T Continue Rules Governing the Identity Predicate and Function Symbols
Homework 7 (see handout): Due Tuesday of Week 9
Reading 51038: Chapter 10.4-10.5
Week 8 continued:

R  Set Theoretic Semantics  
**Reading**: Chapter 7.1-7.2  
**Reading 51038**: Chapter 10.6-10.7  
**Homework 8** (see handout): Due Thursday of Week 9

Week 9:

T  Continue Set Theoretic Semantics; Quasi Decision Procedures  
**Reading**: Chapter 7.3-7.4  
**Homework 9** (see handout): Due Tuesday of Week 10

R  Continue Quasi Decision Procedures; Soundness, Completeness, Undecidability  
**Reading 51038**: Chapter 9.1-9.3  
**Take home exam 2**: Handed Out—Due in class on Tuesday, November 5th

Week 10:

T  Catch Up and Review  

EXTENSIONS OF CLASSICAL LOGIC

R  Leibnizian Modal Logic  
**Reading**: Chapter 11  
**Homework 10** (see handout): Due Thursday of Week 11

Week 11:

T  Continue Leibnizian Modal Logic  
**Reading 51038**: Chapter 15.1  
**Take Home Exam 2**—Due Today

R  Kripkean Modal Logic  
**Reading**: Chapter 12.1-12.2

Week 12:

T  Kripkean Modal Logic  
**Reading 51038**: Chapter 15.2-15.3  
**Homework 11** (see handout): Due Tuesday of Week 13

R  More on Kripkean Modal Logic  
**Reading 51038**: Chapter 16.1

Week 13:
More on Kripkean Modal logic; Strict Conditionals

Reading: Chapter 12.3

Homework 12 (see handout): Due Tuesday of Week 14

Continue Strict Conditionals; Lewis Conditionals (time permitting)

Reading: Chapter 12.4

Week 14:

Intuitionistic Logic

Reading: Chapter 16.2

No Class Thursday Nov. 28th: Thanksgiving Day

Week 15:

Continue Intuitionistic Logic

Reading 51038: Chapter 14

Catch Up and Review

Final exam: Wednesday, December 11th 12:45-3:00

(If I give a take home final exam, we will have a meaningful class meeting at this time. It is recommended, but not required that you read Chapters 15.1-3, 16.1, and 16.3-5.)