INTRODUCTION TO LOGIC

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1 Preliminaries

Sending me a message online (by email or through Canvas) is the best way to reach me, and I will usually respond within 24 hours. If you would like a more immediate response, you can try calling or sending a text message to 267-416-0292. But don't leave a voicemail. I won't get it.

My availability outside of the class meetings: by appointment (Webex, 1050 George Hall)

2 Mississippi State University Syllabus

The Mississippi State University Syllabus contains all policies and procedures that are applicable to every course on campus and online. The policies in the University Syllabus describe the official policies of the University and will take precedence over those found elsewhere. It is the student's responsibility to read and be familiar with every policy. The University Syllabus may be accessed at any time on the Provost website under Faculty and Student Resources: provost.msstate.edu/faculty-student-resources/university-syllabus.

3 Textbook & Software

The textbook for this course is *forall x: the Mississippi State edition*. This textbook is required, and it is available in the Bulldog Bundle. If you opted out of the Bulldog Bundle, you can purchase it from Barnes and Noble or order it online. (There is information for ordering it online in Canvas.) Starting in week 4, we will use the free online logic software *Carnap*. A link that you will use to set up an account in Carnap will be provided.

4 Course Description

This course is an introduction to formal logic. The focus of the course is learning a formal language and then using this language to represent, explain, and evaluate certain kinds of reasoning. There are several reasons for such a course. One is that it is an important sub-field

of philosophy that is worth studying in its own right. It also overlaps with mathematics and computer science, and it is an important part of those disciplines. (In fact, it is fundamental to computer science.) It is also applicable to any field where arguments and reasoning processes are analyzed and evaluated. But, beyond it's direct applications, learning logic is an important part of a complete education. Amanda Ripley makes the point plainly in *The Smartest Kids in the World, and How They Got That Way*. Explaining the value of mastering "the language of logic," she writes,

> It is a disciplined, organized way of thinking. There is a right answer; there are rules that must be followed. More than any other subject, [it] is rigor distilled. Mastering the language of logic helps to embed higher-order habits in [our] minds: the ability to reason, for example, to detect patterns and to make informed guesses. Those kinds of skills have rising value in a world in which information is cheap and messy. (p.70)

While formal logic is a part of philosophy, you will also find that it looks somewhat like math (and, as mentioned above, in some respects, it overlaps with math). As with mathematics, in formal logic, we apply rules and use symbolic expressions—for example, $P \vee Q \vdash \neg P \rightarrow Q$. This "code" and the manipulation of these symbolic expressions follows English rather closely, however, and so it is not as difficult to grasp as you might initially think. We use the symbols because they make the relevant characteristics of the sentences more obvious and manageable. This, in turn, makes investigating the logical properties of the sentences much easier than it would be if we just used English.

5 Learning Objectives

After the successful completion of this course, students will be able to identify arguments, distinguish valid and invalid arguments, translate English sentences into sentences in two formal languages: truth functional logic (TFL) and first-order logic (FOL), construct truth tables, evaluate arguments using truth tables, and construct proofs in the formal languages.

6 Student Honor Code & Academic Misconduct

Mississippi State has an approved Honor Code that applies to all students. The code is as follows:

> As a Mississippi State University student, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.

Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code. For additional information, please visit: `http://honorcode.msstate.edu/policy` and `http://students.msstate.edu/studentconduct/`.

To be clear, students who cheat in any way will be penalized. Cheating includes giving as well as receiving help when such help is not explicitly allowed.

Plagiarism and using AI (i.e., a generative AI tool) are both types of cheating. (See also this longer explanation about A.I. in college. It's written for courses where there is a larger writing component than there will be in this one, but it's still applicable.) The best way to avoid anything that might be academic misconduct is to put yourself in a position where you don't need to cheat or plagiarize. Don't get behind, and if there are things that you don't understand, give yourself time to figure them out or schedule a meeting with me.

Please ask me if you have any further questions about what constitutes academic misconduct. I am happy to answer any questions about what is and is not allowed. But ask me before you do something questionable.

7 Other rules

Cell phone use, including texting, is not allowed during the class meetings.

If there is the legitimate possibility that you might be contacted for an emergency-related reason during the class meeting, then your phone should be nearby, although not so close that it is distracting you. If you are not likely to be contacted for an emergency-related reason, then your phone should be on silent and put away. (And, yes, there is always some possibility of an emergency, but if you can turn your phone off for a couple of hours when you are at a movie or leave your phone behind when you go swimming [or be without access to your phone in a variety of other situations], then you should do the same when you are in a meeting of a college course.) There are at least three reasons for this.

One, I understand the temptation to look at your phone, but learning to manage when you look at and use your phone is an important habit to develop now. Two, when you use your phone during class (or in other kinds of meetings), you may not intend to be rude or distracting, but the person addressing you will usually interpret it negatively. This applies, not only to professors, but to the people with whom and for whom you will work once you graduate. Three, doing anything on your phone takes your attention away from the lecture

or discussion, and even a short break in attention can make it difficult to re-engage with and understand what is going on in the class meeting.

Except when told by the instructor that you can use your laptop to do an in-class assignment, you may not use a laptop or tablet in the class meetings.

The reasons for this are similar to those for cell phones. Laptop use can, in some situations, be perceived as rude, and often it is obvious that the laptop user is not just taking notes. But more importantly, using a laptop creates an enormous barrier to paying attention. Every student who uses a laptop in the classroom spends time on things that are not related to class. Consequently, these students get little or no benefit from being in the classroom, and the students' grades indicate as much. (And don't think that you're good at "multi-tasking." You're not. The human brain doesn't work that way.)

8 Schedule

See the Google calendar in Canvas for the exact schedule.

Weeks 1 & 2	*forall x*, chapters 1 - 3: key concepts of logic
Weeks 3 & 4	*forall x*, chapters 4 - 6: introduction to truth functional logic (TFL)
	Test 1: February 5
Weeks 5 - 7	*forall x*, chapters 7 - 10: truth tables
	Test 2: February 24
Weeks 8 - 11	*forall x*, chapters 11 - 14: proofs in TFL
	Test 3: March 26
Weeks 12 & 13	proofs in TFL continued
Weeks 14 & 15	*forall x*, chapters 17 - 19: first-order logic
Exam week	Test 4: date tba

9 Coursework & Grading

Letter grades will be assigned using this scale: A is 90 – 100 percent, B is 80 – 89 percent, C is 70 – 79 percent, D is 60 – 69, F is below 60. The grades will be set based on this coursework and these percentages:

attendance and participation: 10 percent
quizzes: 20 percent
homework assignments: 25 percent
four tests: 45 percent

There will be two or three assignments (quizzes or homework assignments) due per week. Some of these will be done in class and some will be done outside of class. Each student's

lowest quiz grade and lowest homework grade will be dropped.

Attendance This section is a face-to-face instructional class. Please refer to Academic Operating Policy 12.09, regarding attendance expectations and accommodations. A portion of your grade is based on attendance, and you are expected to attend every class. If you (1) miss a class, (2) have the proper documentation demonstrating that the absence should be "excused," and (3) miss an in-class assignment, you will be given an alternate assignment.