

INTRODUCTION TO LOGIC

Gregory Johnson, Ph.D.

gregory.johnson@msstate.edu

1 Preliminaries

Email 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.

Available meeting times outside of class: Thursday, 2:00 - 3:30 pm and by appointment (071 College Park)

2 Readings & Software

All of the readings are posted on Canvas. We will begin with "An Introduction to Arguments," and then, for the rest of the course, we will use the textbook *forall x: the Mississippi State edition*. Starting in week five, we will use the free online logic software Carnap (<http://carnap.io/>). The link to our course page in Carnap is posted on Canvas.

3 Course Description

This course is an introduction to formal logic. The primary focus of the course is learning a formal language, which is then used for representing, explaining, and evaluating certain kinds of reasoning. There are several purposes 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. Beyond its direct applications, however, 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 formal techniques and use symbolic expression—for example, $P \vee Q \vdash \neg P \rightarrow Q$. Don't be intimidated by the symbols. The use of symbols makes the relevant characteristics of the sentences more obvious and manageable, and once you have a grasp of them, they present no difficulty.

3.1 synchronous online

This is a “synchronous online” course, meaning that we will have weekly meetings at the designated time (Thursdays, 6:45 - 9:15 pm) using Webex. This is probably a new way of taking a course for some (or maybe all) of you, and so we will take some time to make sure that everyone is on track. As it says below, though, part of your course grade will be based on attendance and participation, and so you will be expected to be present (sitting at a table or desk, with your webcam on) and actively participating. That will require doing the assigned reading before each class meeting, and being prepared to discuss it. (Although, in some cases, we will spend some class time making sure that we are all clear on the content of the reading.)

4 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 a formal language (TFL), construct truth tables, evaluate arguments using truth tables, and construct proofs in a formal language (TFL).

5 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. Student 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 is also a form of cheating. 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 ask me about them.

If you have any further questions about what constitutes cheating, either ask me or see the University's policy on academic dishonesty. (I am happy to answer to any questions about what is and is not allowed. But ask me before you do something questionable.)

6 Cell Phones

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.

7 Schedule

See the Google calendar on Canvas for the exact schedule. The calendar is also available [here](#).

Weeks 1 & 2	"An introduction to arguments"
Week 3 & 4	forall x, chapters 3 - 6: introduction to truth functional logic Test 1 is on September 17 .
Weeks 5 - 8	forall x, chapters 8 - 11: truth tables Test 2 is on October 7 .
Weeks 9 - 13	forall x, chapters 13 - 16: proofs
Week 14	forall x, chapter 17: theorems
Week 15	forall x, chapter 18: soundness and completeness
Exam week	Test 3 is on December 9 .

8 Coursework & Grading

Letter grades will be assigned using the standard Mississippi State scale (an A is 90 – 100 percent, a B is 80 – 89 percent, a C is 70 – 79 percent, etc.). The grades will be set based on this coursework and these percentages:

- attendance and participation: 10 percent
- quizzes and homework assignments: 50 percent
- three tests: 40 percent

There will be two or three assignments due per week. Some of which will be done in class and some of which will be done outside of class. Each student's two lowest quiz or homework grades will be dropped. **To pass this course, your average on the three tests has to be 60 percent or higher.** There will not be any extra credit at the end of the course, and so you should do as well as you can throughout the semester.

Honorlock We might use the proctoring software Honorlock for some of the tests. There is information about using it on Canvas, but right now, you should make sure that you have a working webcam—either the webcam built into your laptop or an external one (which doesn't have to be HD or otherwise fancy).

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.

9 Disability Accommodations

Mississippi State University is committed to providing equitable access to learning opportunities for all students. Student Services at MSU-Meridian collaborates with students who have disabilities to arrange reasonable accommodations. If you have, or think you may have, a disability, please contact Skye Hamilton, Student Services Coordinator at 601-484-0234 or shamilton@meridian.msstate.edu to arrange a confidential discussion regarding equitable access and reasonable accommodations. Disabilities may include, but are not limited to, conditions related to mental health, chronic health, attention, learning, autism, brain injury, vision, hearing, mobility, speech, or intellectual disabilities. In the case of short-term disabilities (e.g., broken arm), students and instructors can often work to minimize barriers. If additional assistance is needed, please contact the Student Services Coordinator.

10 Title IX

MSU is committed to complying with Title IX, a federal law that prohibits discrimination, including violence and harassment, based on sex. This means that MSU’s educational programs and activities must be free from sex discrimination, sexual harassment, and other forms of sexual misconduct. If you or someone you know has experienced sex discrimination, sexual violence, or harassment by any member of the University community, you are encouraged to report the conduct to MSU’s Director of Title IX/EEO Programs at 662-325-8124 or by e-mail to titleix@msstate.edu. Additional resources are available here:

<http://students.msstate.edu/sexualmisconduct/>

<http://www.msstate.edu/web/security>

11 University Safety Statement

Mississippi State University values the safety of all campus community members. Students are encouraged to register for Maroon Alert texts and to download the Everbridge App. Visit the Personal Information section in Banner on your MyState portal to register.

To report suspicious activity or to request a courtesy escort via Safe Walk, call University Police at 601-934-0863, or in case of emergency, call 911. For more information regarding safety and to view available training resources, including helpful videos, visit: <http://ready.msstate.edu>.