

# Logic and Critical Thinking – Argumentation

Dr. Michael Hoffmann

## Focus

The main objective of this seminar is to learn and to train a method of argumentation that can be used to clarify your thinking about problematic or controversial issues. The method is called “Logical Argument Mapping” (LAM). It can be used for the analysis of texts and communication; for collaborative and individual problem solving, decision making, and deliberation; and for the resolution of conflicts. This class focuses especially on LAM’s logical foundations, and on using the method in group work.

## New Ways of learning

The working style of this seminar is based on the assumption that argumentation is mainly a *practice* that demands specific skills. In order to foster our abilities to argue and to think critically, the basic activities in this seminar will be *reading, writing, discussing, re-writing, and presenting*. Our class meetings will be reserved for discussions about the homework assignments, and for the construction, presentation, and discussion of exemplary argument maps. To prepare these discussions, you have to read sections from our textbook and do the tasks that you will find for each class meeting in T-Square, Georgia Tech’s classroom management system. Before coming to class, check for each meeting under “Assignments” in T-Square.

During the last weeks of class we will primarily work in groups to develop argument maps, to present them in front of class, and to argue against each other in pairs of groups. We will form these groups already at the beginning of the semester, based on your interests. Each of you will be responsible for the success of your group.

## Readings

*Book to buy at the Engineers Bookstore:*

- Lewis Vaughn, *The Power of Critical Thinking: Effective Reasoning About Ordinary and Extraordinary Claims* (New York, Oxford: Oxford University Press, 2008, 2nd ed.).

*Download from “Resources” at <https://t-square.gatech.edu/portal>:*

- Boolean Operators: <http://www.rbjones.com/rbjpub/logic/log048.htm>
- Economist (2006a). Liberalism and neurology. Free to choose? Modern neuroscience is eroding the idea of free will. *The Economist*, Dec 19th.
- Economist (2006b). Organ transplants. Your part or mine? Iran's example, and the broader case for making it worthwhile to give kidneys. *The Economist*, Nov 16th.
- Israel’s fence, a flyer (pdf file)
- Miller, M. (2007). Response to Jack Donnelly: “The Relative Universality of Human Rights”.

**Schedule**

<i>Week</i>	<i>Date</i>	<i>Theme</i>	<i>Texts</i>
1	Jan 6	Introduction; Logical Argument Mapping	
	Jan 8	Workgroups	LAM Manual; book
2	Jan 13	Basics	3-21
	Jan 15	Workgroups	30-33; Israel's fence
3	Jan 20	Deduction, induction, validity, etc.	67-85
	Jan 22	Workgroups	64-66; 470: Essay 3
4	Jan 27	Deduction: Propositional Logic	211-240; Boolean Operators
	Jan 29	Workgroups	116-119; 470: Essay 3
5	Feb 3	Argument Schemes	87-111
	Feb 5	Workgroups on free will	167-171; Economist (2006a)
6	Feb 10	Deduction: Categorical Logic	245-273
	Feb 12	Workgroups on free will	203-207; Economist (2006a)
7	Feb 17	Induction and analogy	278-302
	Feb 19	Causal arguments; exercises in groups	305-321; book
8	Feb 24	Caution: Fallacies	173-195
	Feb 26	Preparation for the test	group exercises week 7.3
9	Mar 3	Test on weeks 3 to 9	
	Mar 5	Workgroups on kidney transplants	Economist (2006b)
10	Mar 10	Ethics and moral argumentation	442-485
	Mar 12	Workgroups	Economist (2006b)
	M. 17-19	<b>Spring break</b>	
11	Mar 24	Workgroups: human rights and democracy	Miller 2007
	Mar 26	Workgroups: human rights and democracy	Miller 2007
12	Mar 31	Workgroups: human rights and democracy	Miller 2007
	Apr 2	Workgroups: human rights and democracy	Miller 2007
13	Apr 7	Individual presentations of argumentations on the issue you signed up for	based on your own search for materials
	Apr 9	Workgroups develop a common map	your map from 13.1.
14	Apr 14	Workgroup presentations	Group map 13.2
	Apr 16	Workgroups revise their maps	
15	Apr 21	Collaboration of pairs of workgroups	Group map of week 14
	Apr 23	Pairs of workgroups present their maps	

### Tools (links are in T-Square, folder “Resources”)

- Boolean Operators: <http://www.rbjones.com/rbjpub/logic/log048.htm>
- Cmap (<http://cmap.ihmc.us/>), the software we will use for Logical Argument Mapping. Please download from: <http://cmap.ihmc.us/download/>.
- LAM manual at <http://www.prism.gatech.edu/~mh327/LAM/>.
- “Tools for Philosophy.” A document that lists encyclopaedias (books and online) that can help if you have problems with philosophical terminology.

### Grading

The basis for the grade you can get for this course is your *continuous* reading, writing, and participating in our class discussions. You have to work hard to get the grade you wish to have, but this work is equally distributed over the whole semester. There is only one test, but no final exam.

#### *Attendance*

Since you will learn mainly by our class discussions, **attendance** is mandatory. There will be 30 class meetings over the whole semester. Independently of the other points you can get in the areas listed below, you will get an “F” if you attend less than 20 meetings, and nothing better than a “C” if less than 24. Please sign the attendance sheet that will be available only during the first 5 to 10 minutes of each class.

#### *Participation*

10% of your final grade will depend on the amount and quality of your **contributions** to our class discussions over the whole semester. Your contributions are essential for this seminar-style class. You should be ready, for example, to present your homework in class, especially your argument maps, but also the results of your group work.

Maximum for your contributions to class discussions: **10 points**.

#### *Homework, first version*

30% can simply be reached by submitting your answers to the “Assignments” tasks in T-Square **before class starts** on Tuesday. Only T-Square submissions are accepted, but you should save copies on your own computer. You can “save” your work in T-Square (do that when you leave your computer for a while, because after a while you have to log-in again and everything will be lost otherwise), but you have to click “submit” before the deadline.

There are first version assignments for 13 weeks, but I will count only 10 weeks (that gives you some flexibility). I will not evaluate the quality of these first version answers, but you have to submit them before class on Tuesday, and they must be complete (3 points for each, less for incomplete).

Maximum for first version homework: **30 points**.

#### *Homework, second version*

Although the first versions will not be assessed, you should use the class discussion about the tasks to revise your answers at home. This will be important as preparation for the test. In 6

weeks it is possible to submit second (revised) versions of your homework. I will evaluate these second versions, especially your development between the first and second version (max. 5 points). Evaluation criteria for argument maps are the rules and conventions of Logical Argument Mapping as described in the LAM manual. You should check my comments on these second versions that you will find in T-Square. On these revisions depend another 25% of your final grade.

You will find the weeks for which second versions are possible in the “Assignments” list in T-Square, they are named “x.2.” I expect the second versions each week by Thursday before class starts. However, you can submit these second versions within three weeks (there is a second deadline set in T-Square which is invisible for you. Those submissions will be marked as “late” but that does not matter for the evaluation). For the last weeks of the semester, however, you will have less than 3 weeks for your second version because there is a final deadline at the end of the semester: April 30.

Out of 6 possible second versions, I will count only your 5 best ones. Maximum for second version homework: **25 points**.

### *Test*

There will be a test on March 3 that covers week 3 to 9. Maximum: **14 points**

### *Group work*

On most of the Thursdays we will work in groups. Please submit the results of your group work via T-Square after class (3 points, no evaluation; sometimes there is only one submission for two weeks of group work, 6 points; deadline is the next day, Friday 5pm). Please check the instructions under “Assignments” (they are listed as “x.3”) **before you come to class** since here is listed what you have to read as preparation.

Don’t forget to put all the names of the group members on your submission (if you work over more weeks, list for each day; 3 points only for those who actually participate). It is sufficient to send only one assignment per group. (Note: the work group assignments for the last weeks count differently; see the instructions for each week under “Assignments”).

From the 9 possible work group assignments, I will count 7. Maximum: **21 points**.

*Check your points regularly to see whether the system works, and check my comments on your work to learn for later assignments.*

During the whole semester, you can see all your points in the “Gradebook” of T-Square. But give me a few days to put them into the system.

### *Transformation in letter grades*

A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

### **Academic Honor Code**

Based on GT's Honor Advisory Council recommendation I would like to clarify the following points: You are allowed (and encouraged) to work together with other students on homework, as long as you write up and turn in your own solutions (if not otherwise specified "Assignments" in T-Square). Submitting any work other than your own is a violation of the Academic Honor Code. Quoting other authors, of course, is common scientific practice. However, you have to make absolutely clear what are your own formulations, and what those of others. You can quote the texts of our seminar in short form (e.g. "Vaughn, p. 52"). Other sources have to be listed under "References." Plagiarism will be dealt with according to the GT Academic Honor Code. Note that plagiarizing is defined by Webster's as "to steal and pass off (the ideas or words of another) as one's own : use (another's production) without crediting the source."

For any questions involving these or any other Academic Honor Code issues, please consult me or [www.honor.gatech.edu](http://www.honor.gatech.edu). See also the GT STUDENT CODE OF CONDUCT at <http://www.deanofstudents.gatech.edu/codeofconduct>.

### **Contact**

Feel free to contact me if there are any problems you would like to discuss. My **office hours** are Tuesday 3:00-4:00 pm or by appointment. The office is located in the basement of the DM Smith Building, room 004. My **phone number** is 404-385-6083. The easiest way to contact me is by **e-mail**: [m.hoffmann@gatech.edu](mailto:m.hoffmann@gatech.edu).

**Enjoy the class, and let me know if there any problems!**