

CAS LX 432 / GRS LX 732  
**Intermediate Semantics**

Fall Semester 2019  
Boston University

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**Course description.** This course is about how the meanings of complex expressions in natural languages are built up from the meanings of their parts (*compositionality*), and when and why one sentence implies another (*consequence*). Although we will mainly use English examples to build up our theoretical toolbox, students will have several opportunities to explore cross-linguistic variation, including in the final project.

As the course progresses, students will build up a *fragment* of English, including:

- Lexical entries, for:
  - logical words like English *if, not, a, the, nobody, which, him, you, now, and then*;
  - morphemes like the English plural *-s* and past tense *-ed*
- Composition rules for putting them together

This practice of building fragments stems from the pioneering work of Richard Montague, the grandfather of modern formal semantics, who brought together the fields of mathematical logic and linguistics. Montague’s most paradigmatic work, an article entitled “The Proper Treatment of Quantification in Ordinary English” (1973), is explicated very nicely in the textbook *Introduction to Montague Semantics* by Dowty et al. (1981). This course is heavily influenced by that book, and interested students are warmly encouraged to read it at some point. Using the excellent pedagogical software called the Lambda Calculator created by Lucas Champollion, we will be able to carry out Montague’s program in modern style by encoding our fragment in a computer, making *digital fragments*.

The three most important composition rules that we will learn are: *Functional Application*, *Predicate Modification*, and *Predicate Abstraction*. These composition rules are standardly known in the formal semantics community and are laid out in the widely-used textbook *Semantics in Generative Grammar* by Irene Heim and Angelika Kratzer 1998. Interested students are encouraged to read this book as well at some point. It very much looms in the background for this course, and in fact, this course has previously been taught using that book. But here, the same theory of composition will be presented as in *Invitation to Formal Semantics*, which uses more traditional and precise notation (notation which is furthermore aligned with the Lambda Calculator software), is explicitly *model-theoretic* as in Montague’s work (so truth and meaning are defined relative to a model), and is aimed at undergraduate students.

This makes it sound like there is one and only one theory that you will be forced to accept. Indeed, with respect to certain questions, we will do very little to consider alternative views

and merely present a single, ‘standard’ view. Intermediate-level proficiency in semantics requires familiarity with this basic setup. (This is not to discourage you from challenging whatever is dogmatically presented; on the contrary, you are encouraged to think slowly and carefully about what is really being said, identify any potential challenges, and imagine alternatives.) But in other cases, we will engage in the practice of hypothesis-comparison, where we consider two different theories, compare their empirical predictions, and see which one fares better in the face of the facts.

**Learning objectives.** Students who take this class will:

- gain familiarity with a diverse range of semantic phenomena and their empirical characteristics;
- engage in the incremental construction of a formal fragment that captures these facts;
- gain proficiency with some of the standard tools of compositional semantics;
- develop an ability to compare among different semantic theories using appropriate empirical data, an ability that is comprised of several important sub-skills: (i) identifying predictions of a theory; (ii) finding places where the predictions of two theories differ; and (iii) finding out which prediction is actually met, using appropriate empirical data
- have an opportunity to compare among analyses of a semantic phenomenon that particularly interests them.

Students enrolled at the graduate level will, furthermore, take steps toward an original research project in formal semantics.

**Prerequisite.** CAS LX 331/ GRS LX 631 Semantics & Pragmatics: Introduction to Linguistic Meaning (or CAS LX 502) or consent of instructor.

### Course materials

- Coppock, Elizabeth and Lucas Champollion (manuscript). *Invitation to Formal Semantics* (previously known as *Semantics Boot Camp*). Excerpts distributed through Slack.
- The Lambda Calculator. This is a software program designed for teaching and learning semantics designed by Lucas Champollion, Josh Tauberer and Maribel Romero. We will use for some exercises. Download it at:

<http://lambdacalculator.com>

**Courseware.** The materials for the course will be made available on Blackboard at <http://learn.bu.edu>.

**Assessment.** The final grade will be determined as follows:

- 60% problem sets
- 10% class participation & attendance
- 10% group presentations
- 20% final project

*Problem sets.* Weekly exercises concerning the readings and lecture material, through which students will build up a compositional fragment of English. You may not ask any other student what answer they got for any question, or tell another student what answer you got for a question. You may give each other hints.

Anything that even remotely suggests that you are blindly writing down what somebody else said without thinking through the issue for yourself will be followed up on as a potential case of plagiarism. Unacceptable behavior includes: (i) copying and pasting another student's answers; (ii) conferring with a student other than your partner in real time in person or remotely while writing solutions; (iii) using another student's completed solutions as a guide to producing your own. When you write your name at the top of your assignment (as I hope you will remember to do!), you indicate that you are the *author* of the document. Always make sure that this is genuinely the case; otherwise, you are plagiarizing.

The lowest problem set grade will be dropped. There are 10 problem sets in total. You are exempt from the problem set on the week that you present (see below), so this portion of the grade will be determined on the best 8 of the remaining 9 problem sets.

*Group presentations.* Students will work in groups of 2-4 to present two opposing analyses of a phenomenon discussed in the textbook and comparing their predictions. The presentations should take place over the course of two sessions. The first session should lay out the alternative analyses, and the second session should assess the relative empirical adequacy of the two theories. The debate topics are indicated in the schedule below. *Presentations will be evaluated on clarity, timing, persuasiveness, and technical competence.* Those who are making the group presentation for the week are exempt from the problem set for the week.

*Class participation.* Class time is an important component of your learning process. This is a chance to explore the material more deeply through interactive learning experiences, and learn from your peers; this can't be made up. Therefore, in order to honor this educational opportunity, please come to every class session on time and ready to learn actively. Attendance at each class meeting affects your classroom participation grade, as will the degree to which you are mentally present during class, take active responsibility for your own learning, and help others learn. When other students are presenting, students are expected to listen actively to others' presentations, offer reflections, and raise questions and potential objections at appropriate points.

*Final project.* For the final project, students may work in groups of 2 or 3 or individually. The final project should compare multiple different analyses of a phenomenon discussed in prior semantics literature, ideally, in a language other than English. The analyses you discuss should be formalized in the style we develop in class, so it does not suffice to blindly copy formulas from the literature; you might have to change the notation a bit in order to make it conform to our style. **Extra credit** is available to groups who implement one or more analyses in the Lambda Calculator; including such implementations in your final project is encouraged. You can find examples of formal semantic analyses in the journals

*Natural Language Semantics, Journal of Semantics, Natural Language and Linguistic Theory, Linguistics and Philosophy, and Semantics and Pragmatics.* Other good sources of semantics papers include the proceedings of the annual Semantics and Linguistic Theory conference, as well as the proceedings of Sinn und Bedeutung (the main annual semantics conference in Europe) and the proceedings of the Amsterdam Colloquium.

Graduate students are asked to incorporate **some element of originality** in their final project, either by considering existing analyses with respect to a new phenomenon or by offering an original theory of some phenomenon (new or old). The originality component makes up 25% of the final project grade for graduate students. I recommend starting by perusing the journals listed above for papers related to your research interests, in order to find a place where you can make an original contribution.

By **Monday, November 18**, please communicate with me about what phenomenon you would like to study (via direct message on Slack), and whether you already have someone to work with. After that point, I will assign partners, unless you prefer to work on your own. It is highly encouraged, though not required, that you set up a meeting with me before this date in order to discuss ideas. Your final project plan is due **Monday, November 26** (the last day before Thanksgiving). The plan should consist of:

- the language (e.g. Akan)
- the phenomenon (e.g. definite articles)
- the question for debate (e.g. ‘In terms of Florian Schwarz’s typology of definites, is Akan *nó* strong or weak?’)
- at least two relevant scholarly works (including author(s), year, title, how/where published, and URL if available)

Teams will be asked to present their project ideas in class on that day; this can be very informal. You will present your project during the last week of class and during the exam period. As part of your presentation materials (e.g. slides or handout), mention explicitly how the individual team members contributed to the project.

The project will be evaluated solely on the basis of the presentation. As with the group presentation, the final project presentation must present both analyses, and adjudicate among them on the basis of empirical data. *Presentations will be evaluated on clarity, timing, persuasiveness, and technical competence.*

Students who wish to **write up** the final project as a short paper may do so for **extra credit** up to 5% of the final grade, to be shared equally among the team members who contribute to the write-up. The paper should address what the presentation addresses, and be well-organized into coherent sections consisting of paragraphs. Each paragraph should make exactly one point (no more, and no fewer), and consist of at least two sentences. Each sentence should be literally true ( $\leftarrow$  *magical writing tip*). The paper should adhere to common standards of spelling, word usage, and punctuation in written English. I am happy to look over any draft that has already been proofread at least once, any time prior to 48 hours before the deadline. (Consider seeking help with proofreading from the CAS Writing Center.) The write-up, if you choose to do it, would be due December 17 at midnight.

**Gear.** For every class meeting, please bring a notebook and a pencil for taking notes. Given the huge potential for distraction, as well as educational research showing that taking notes by hand leads to better results than taking notes on a laptop, electronic devices must be put away, except when we are using laptops for a specific classroom activity.

**Late policy.** Because the material in this class builds up cumulatively, it is important that you stay on track with the homework assignments. Dealing with late homework assignments is also very time-consuming for instructors. Therefore, late homeworks will not be accepted except under extenuating circumstances. If anything stands in the way of your ability to finish your homework on time, please request an extension as soon as possible. Extensions will not be granted less than 24 hours before the deadline except in case of emergency. In general, homeworks are due by the start of class on Wednesdays. A smart strategy is to try to finish by the start of class of Monday so that if you have any questions you can ask them in class on Monday.

**Academic Conduct.** Boston University's Academic Conduct Code is accessible at <http://www.bu.edu/academics/policies/academic-conduct-code/>. The Academic Conduct Code for graduate students is accessible at <http://www.bu.edu/cas/students/graduate/grs-forms-policies-procedures/academic-discipline-procedures/>. Plagiarism in any form (including from online sources) and other academic misconduct is contrary to our goals and will not be tolerated. If you are unsure of any aspect of these policies, please ask!

**Well-being.** Learning and well-being are inextricably linked. In the event that you are experiencing struggles or mental health symptoms, and you need additional support, if you would like, you can speak with me and I will listen and most likely remind you of the many resources here at BU. Actually, as you may already know, BU has a wealth of student support systems in place, with licensed counselors available to speak with you (see <https://www.bu.edu/students/health/counseling/>). As a BU student, help is available to you at 24 hours a day, 7 days a week. Appointments for regular care are available from 8 a.m. to 8 p.m., Monday through Thursday, and 8 a.m. to 5 p.m. on Friday. Phone assistance is available at all times at 617-353-3569 (BU's Behavioral Medicine Services Line). Emergencies are attended to immediately. Crisis intervention counselors are available and coordinated with other counseling resources on campus, such as with BU Psychological Services. These confidential services are easily accessible to help you manage personal challenges that may threaten your well-being and your learning goals. Know that if you do come to me for support, I cannot keep confidential any concerns related to safety (of yourself or others). Overall, taking steps to focus on your well-being, and reaching out for help if needed, are important and courageous things to do – for yourself and for those who care about you.

**Accommodations for Students with Documented Disabilities.** If you are a student with a disability or believe you might have a disability that requires accommodations, please contact the Office for Disability Services (ODS) at (617) 353-3658 or [access@bu.edu](mailto:access@bu.edu) to coordinate any reasonable accommodation requests. ODS is located at 19 Deerfield Street on the second floor (19 Buick Street as of September 1, 2018).

**Communication.** We will use Slack for communication (<https://slack.com>). It is freely downloadable on many computer platforms, and can also be used on a mobile phone. You will be invited to join the workspace through your BU email address. This is the only place where course announcements will be sent, so please stay on top of your Slack communications. You are welcome to send me a direct message on Slack at any time, and I will respond as soon as I can.

### Schedule (subject to revision)

Numbers under ‘Reading’ indicate a chapter/section of *Invitation to Formal Semantics*.

Week 1: Sets and relations			Reading	Problem Sets
W	Sept. 4	Welcome		PS1 out
F	Sept. 6	Sets and NPIs	1, 2.1-2.2	
Week 2: First-order logic				
M	Sept. 9	Functions	2.3-2.4	
W	Sept. 11	Propositional logic	3.1-3.3	PS1 due, PS2 out
F	Sept. 13	Predicate logic	3.4-3.5	
Week 3: Type theory and Functional Application				
M	Sept. 16	Quantifiers in predicate logic	3.6	
W	Sept. 18	Lambda calculus	4	PS2 due, PS3 out
F	Sept. 20	Functional Application	5.1	
Week 4: Quantifiers in natural language				
M	Sept. 23	Functional Application	5.2-5.3	
W	Sept. 25	Negative concord: Debate		PS3 due, PS4 out
F	Sept. 27	<b>Liz out of town</b>		
Week 5: Modifiers and descriptions				
M	Sept. 30	Negative concord: Debate		
W	Oct. 2	Predicate Modification	6.1	PS4 due, PS5 out
F	Oct. 4	Relative clauses & pronouns	6.2-6.3	
Week 6: Quantifier Raising				
M	Oct. 7	Quantifiers	6.3	
W	Oct. 9	Quantifier raising	7.1-7.2	PS5 due, PS6 out
F	Oct. 11	Quantifier raising	7.3	
Week 7: Presupposition				
M	Oct. 14	<b>Indigenous People’s Day</b>		
T	Oct. 15	Quantifiers and adverbs	7.4	
W	Oct. 16	Presupposition	8	PS6 due, PS7 out
F	Oct. 18	Definites: Debate		

Week 8: Indefinites				
M	Oct. 21	Definites: Debate		
W	Oct. 23	Dynamic semantics	9	PS7 due, PS8 out
F	Oct. 25	Indefinites: Debate		
Week 9: Coordination and plurals				
M	Oct. 28	Indefinites: Debate		
W	Oct. 30	Coordination	10	PS8 due
F	Nov. 1	Plurals: Debate ( <i>on the two</i> )		
Week 10: Event semantics				
M	Nov. 4	Plurals: Debate ( <i>on the two</i> )		PS9 out
W	Nov. 6	Event semantics	11	
F	Nov. 8	<b>BUCLD</b>		
Week 11: Tense				
M	Nov. 11	Aspect	12.1-12.2	
W	Nov. 13	Tense	12.3-12.6	PS9 due
F	Nov. 15	Tense: Debate		
Week 12: Intensional semantics				
M	Nov. 18	Tense: Debate		PS10 out, <b>Project idea due</b>
W	Nov. 20	Intensional semantics	13	
F	Nov. 22	Intensional semantics		
Week 13				
M	Nov. 26	Project check-in		<b>Project proposal due</b>
W	Nov. 27	<i>Thanksgiving</i>		
F	Nov. 29	<i>Thanksgiving</i>		
Week 14				
M	Dec. 2	Presentation advice		PS10 due
W	Dec. 4	Final project presentations		
F	Dec. 6	Final project presentations		
Week 15				
M	Dec. 9	Final project presentations		
W	Dec. 11	Final project presentations		

Final project write-up (optional; extra credit) due Tuesday, December 17th.

## References

- Dowty, David, Robert E. Wall & Stanley Peters. 1981. *Introduction to Montague semantics*. Dordrecht: Kluwer.
- Heim, Irene & Angelika Kratzer. 1998. *Semantics in generative grammar*. Oxford: Blackwell.