Ling 325, Class Grammar. Revised 3/4/05.

A. Inventory of denotations. Let D be the set of all individuals in the actual world. Possible denotations are:

Members of D; Subsets of D; Subsets of D × D;[1] Subsets of Pow(D) × Pow(D), Members of {0,1}.

B. Lexicon.

N: ⟦**Greg**⟧ = Greg, ⟦**Alicea**⟧ = Alicea, etc.
⟦**cat**⟧ = {x | x is a cat}, ⟦**governor$_1$**⟧ = {x | x is a governor},
⟦**description$_1$**⟧ = {x | x is a description}, etc.
⟦**governor$_2$**⟧ = {<x,y> | x is a governor of y},
⟦**description$_2$**⟧ = {<x,y> | x is a description of y}, etc.

V: ⟦**smoke**⟧ = {x | x smokes}, ⟦**drink**⟧ = {x | x drinks}, etc.
⟦**govern$_{active}$**⟧ = {<x,y> | x governs y}, ⟦**describe$_{active}$**⟧ = {<x,y> | x describes y}.

A: ⟦**honest**⟧ = {x | x is honest}, ⟦**afraid**⟧ = {x | x is afraid}, etc.
⟦**fond**⟧ = {<x,y> | x is fond of y}, ⟦**afraid**⟧ = {<x,y> | x is afraid of y}, etc.

P: ⟦**outside**⟧ = {x | x is outside}, ⟦**inside**⟧ = {x | x is inside}, etc.
⟦**near**⟧ = {<x,y> | x is near y}, ⟦**from**⟧ = {<x,y> | x is from y}, etc.

Conj: **and**, **or**, *Adv*: **not**, *I*: **should**, **will**, **can**, **do**, **might**, etc.,

D: ⟦**some**⟧ = {<A, B> | A ∩ B ≠ Ø}, ⟦**no**⟧ = {<A, B | A ∩ B = Ø},
⟦**every**⟧ = {<A, B> | A ⊆ B}, ⟦**most**⟧ = {<A, B> | |A ∩ B| > |A – B|}, etc.

C. Syntactic rules.

Phrase structure rules:

S → NP I VP	VP → V’	V’ → V NP	V’ → V PP
V’ → V AP	V’ → V	VP → VP Conj VP	
NP → (D) N’	N’ → AP N’	N’ → N’ PP	N’ → N (PP)
PP → P’	P’ → P (NP)	AP → A’	A’ → A (PP)
VP → Adv VP	AP → AP Conj AP		PP → PP Conj PP

[1] D × D (“the *Cartesian product* of D with D”) is defined as {<x, y> | x ∈ D and y ∈ D}, which is the set of all ordered pairs of elements of D.

Movement/Transformations:
1. *V-Raising*. Raise main verb *be* to I.

D. Semantic rules of composition.

1. If α is a non-branching node whose daughter node is β, then ⟦α⟧ = ⟦β⟧.
2. If α is of the form [$_S$ [$_{NP}$ N’] I VP], then ⟦α⟧ = 1 iff ⟦NP⟧ ∈ ⟦VP⟧.
3. If α is of the form [$_{VP1}$ VP$_2$ [$_{Conj}$ and] VP$_3$], then ⟦α⟧ = ⟦VP$_2$⟧ ∩ ⟦VP$_3$⟧.
4. If α is of the form [$_{VP1}$ VP$_2$ [$_{Conj}$ or] VP$_3$], then ⟦α⟧ = ⟦VP$_2$⟧ ∪ ⟦VP$_3$⟧.
5. If α is of the form [$_{VP1}$ [$_{Adv}$ not] VP$_2$], then ⟦α⟧ = ⟦VP$_2$⟧$^-$.
6. If α is of the form [$_{VP}$ [$_{V'}$ [$_V$] AP]], then ⟦α⟧ = ⟦AP⟧.
7. If α is of the form [$_{VP}$ [$_{V'}$ [$_V$] PP]], then ⟦α⟧ = ⟦PP⟧.
8. If α is of the form [$_{AP1}$ AP$_2$ [$_{Conj}$ and] AP$_3$], then ⟦α⟧ = ⟦AP$_2$⟧ ∩ ⟦AP$_3$⟧.
9. If α is of the form [$_{AP1}$ AP$_2$ [$_{Conj}$ or] AP$_3$], then ⟦α⟧ = ⟦AP$_2$⟧ ∪ ⟦AP$_3$⟧.
10. If α is of the form [$_{X'}$ X YP], then ⟦α⟧ = {x | <x, ⟦YP⟧> ∈ ⟦X⟧}.[2]
11. If α is of the form [$_S$ [$_{NP}$ Det N’] I VP], then ⟦α⟧ = 1 iff <⟦N’⟧, ⟦VP⟧> ∈ ⟦D⟧.
12. If α is of the form [$_{N'}$ AP N’] then ⟦α⟧ = ⟦AP⟧ ∩ ⟦N’⟧.
13. If α is of the form [$_{N'}$ N’ PP], then ⟦α⟧ = ⟦N’⟧ ∩ ⟦PP⟧.

E. Pronunciation (or “PF”) rules.

1. *VP Deletion (optional)*.
Do not pronounce (i.e., *delete*) a VP that is syntactically identical to the VP of an immediately preceding sentence in the discourse. A deleted VP cannot contain *not*.

2. *Affix Hopping*.
Lower an inflectional suffix in I to V if I and V are adjacent.

3. *Do-Support*.
Insert *do* to bear a stranded inflectional suffix in I.

[2] If YP is of the form [$_{PP}$ [$_{P'}$ [$_P$ *of*] NP],] then the denotation of ⟦YP⟧ = ⟦NP⟧.