Syntax – the study of the system of rules and categories that underlies sentence formation.

1) Syntactic categories
- **lexical:** words that have meaning (semantic content)
  - words that can be inflected
  - includes **nouns, verbs, adjectives, adverbs, prepositions**
- **Nonlexical:** words whose meaning is harder to define
  - words that have a grammatical function
  - includes **determiners, auxiliary verbs, degree words, conjunctions**

2) Phrase (a unit of sentence structure between a word and sentence)
- Phrases have **heads.** NP has a N, AP has an Adj, VP has a V, PP has a P
- Optional **specifier.**  
  - Det (determiners) specify a Noun (the, a, these, that)
  - Adv (adverbs) specify a Verb (always, often, never)
  - Deg (degree words) specify an Adjective or a Preposition (very, quite, almost)
- Optional **complements.** In English they come after the head.

3) Phrase Structure Tests – to determine whether a group of words is or is not a syntactic unit.
- **substitution test** e.g. NP can be substituted with they, she, VP can be substituted with do so, PP can be substituted with there.
  - **movement test** e.g. *The children bought candy at the store* > *At the store, the children bought candy*

4) Phrase Structure Trees

```
  X P            X P  =  N P ,  V P ,  P P
  Spec = Det, Adv, Deg
  X' = intermediate level (always present in repr)
  X = head of XP = N, V, P
  Comp = PP, NP, VP
```

exemplify: a book on Shakespeare

**Ex4. Using the phrases from Ex2b and then Ex2a draw Phrase Structure Trees.**
Phrase Structure Trees show that a sentence is both a linear string of words and a hierarchical structure with phrases nested in phrases. They show three aspects of speakers’ syntactic knowledge:

a. the linear order of the words in the sentence
b. the groupings of words into syntactic categories
c. the hierarchical structure of the syntactic categories

The trees represent in precise notational form the linguistic properties that are part of speakers’ mental grammars.

5) Phrase Structure Rules (as shown in Fromkin and Rodman – early versions)

- S → NP VP
- NP → (Art) (Adj)* N (PP)
- VP → V (NP) (PP)
- PP → P NP

Ex5. Discuss examples for each option in (5).

6) Simple Sentence structure

A sentence (IP) is the largest unit of syntactic analysis. Like a phrase, a sentence consists of a specifier, a head, and a complement.

- NP. The Noun Phrase is typically referred to as the subject. The subject is the specifier of I
- I (Infl) is the head of the sentence, and it is used to refer to inflection. There are two possibilities for I: +Pst and –Pst. +Pst = sentences in Past Tense, –Pst = present or future.
- VP. Typically referred to as the predicate. VP functions as a complement of I.

```
  IP/S/TP (tense)
     /\                  /\  
    I'   NP (Spec)    Infl (Aux)     VP (Comp)

The children       read    a    book
```

7) Auxiliary Verbs

- modal auxiliary verbs occupy the I position (will, would, can, could, should, must, might, may)
- Nonmodal auxiliary verbs occupy a V position in VP, and take VP as a complement (have, be)

Exemplify: The children will read a book and The children are reading a book

Ex6. In pairs, draw tree diagrams for:

Students often write exams
A penguin walked into the room
Dogs should always go for a walk
Those monsters were hiding under the bed
8) **Complement options** or **Subcategorization**

The **lexicon** must contain more syntactic information than merely the lexical category of each word. (syntactic category + usage)

- a. The boy found the ball
- b. *The boy found quickly cf. walked
- c. *The boy found in the house cf. slept
- d. The boy found the ball in the house

**find**: transitive, must be followed by an NP, its direct object. This additional information is called **subcategorisation** and must be included in the lexical entry of each word.

Subcategorisation accounts for the ungrammaticality of:

- a. *John put the milk,
  
  **put** is a ditransitive, requires direct and indirect object, i.e. NP and PP. Cf. John put the milk in the fridge.

- b. *Disa slept the baby
  
  **sleep** intransitive, so it cannot be followed by an NP

- c. **belief**
  
  - a. The belief in freedom of speech
  - b. The belief that freedom of speech is a basic right
  - must be subcategorised for PP and S (IP)

- d. **sympathy** - subcategorised for PP but not for S
  
  - a. their sympathy for the victims
  - b. *their sympathy that the victims are so poor

9) **A fragment of the lexicon**

<table>
<thead>
<tr>
<th>Verb</th>
<th>Noun</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>put, V, _____ NP PP</td>
<td>put</td>
<td>is a Verb and must be followed by both an NP and a PP within the Verb Phrase</td>
</tr>
<tr>
<td>find, V, _____ NP</td>
<td>find</td>
<td>is a Verb, must be followed by an NP within VP</td>
</tr>
<tr>
<td>sleep, V, ______</td>
<td>sleep</td>
<td>is a Verb and must not be followed by any category within the Verb Phrase</td>
</tr>
<tr>
<td>belief, N, _____ (PP), ____ (S)</td>
<td>belief</td>
<td>is a Noun and may be followed by either a PP or an S within the Noun Phrase</td>
</tr>
<tr>
<td>sympathy, N, _____ (PP)</td>
<td>sympathy</td>
<td>is a Noun and may be followed by a PP within the Noun Phrase</td>
</tr>
</tbody>
</table>

10) **More lexical differences** – different syntactic patterns of verbs: **want, force, try**

- a. The conductor **wanted** the passengers to leave
  
  The conductor **forced** the passengers to leave
  
  *The conductor **tried** the passengers to leave

- b. The conductor **wanted** to leave
  
  *The conductor **forced** to leave
  
  The conductor **tried** to leave

11) **Similar patterns**

- **want**: expect, need, wish
- **force**: allow, order, persuade
- **try**: condescend, decide, manage

Q: What do you think about this statement: *If you know your lexicon you do not need to know Phrase Structure Rules.*
12) **Structural Ambiguity** – Linear order vs. hierarchy / mental architecture
   Remember *war time machine?* vs. *[war [time machine]]* Morphology!
   Cf. *Visiting professors can be interesting*

13) **The boy saw the man with a telescope**
   a. used a telescope to see him

Ex7. Make 13a and 13b passive. Topicalize PP. Ask questions about 13a and 13b.

14) **Sentences with Complement Clauses (CP)**
   Like other syntactic units, a CP consists of a head, a specifier, and a complement. The head of a CP is a complementizer (C). Complementizers include words such as *that, if, whether*. The complement of a complementizer is an IP, a sentence.
Ex8. Diagram the following: Nancy believes that aliens exist, Sailors know that the ship could sink

15) **Recursion** – one reason for the creativity / infinite number of sentences

Remember recursion in compounds? coffee table repair shop assistant position...

16) **Q: What makes this recursion possible?**
   This is the boy that kicked the dog that frightened the cat that ate the mouse that loved the rat that...

17) **Q: What makes this recursion possible?**
   The girl with the feather on the ribbon on the brim of the hat...

18) **Q: What makes this recursion possible?**
   The girl walked down the street over the hill through the woods...

19) **Long distance relationships** – subject – verb agreement is possible due to the hierarchical structure of sentences.
   a. The guy seems kind of cute
   b. The guy we met at the party next door seems kind of cute
   c. Thee guys we met at the party next door seem kind of cute

There seems to be no limit on the distance...
   The guys (guy) we met at the party next door that lasted until three a.m. and was finally broken up by the cops who were called by the neighbours seem (seems) kind of cute.

   ![Syntactic Tree]

   Agreement depends on sentence structure not on the linear order of words, and occurs between the Noun head of the NP immediately below S, and the Verb head of the VP immediately below S, that is, between the Subject NP and the Main Verb of the S – They are sisters.

20) **RECAP:**

   The syntactic trees represent in precise notational form the linguistic properties that are part of speakers’ mental grammars. They account for:
   - the linear order of the words in the sentence (Word Order)
   - the groupings of words into syntactic categories (Functional Groups)
   - the hierarchical structure of the syntactic categories, which lead to
     i) structural ambiguity
     ii) creativity / infinitude (recursiveness)
     iii) agreement relationships
     iv) syntactic movement / manipulation of fragments of sentences as in passivization, PP preposing (topicalization), question formation, etc.
21) **Transformations** – structure modifications that capture the relationship between e.g. declarative sentences and yes-no questions, active and passive, etc. In some syntactic approaches Move is an operation that transforms one structure into another type of structure, e.g. statement > question. Move does this by transporting elements from one position in a sentence to another. Moved elements leave traces.

22) Every sentence includes a CP. Auxiliaries move to C. Wh phrases move to the specifier position of C. If C contains +Q, the structure is a question. If C is empty, it is a statement.

a. question

```
CP
  C
    +Q
  C'
    N P
    IP/S...

Auxiliary
Wh-phrase
```

b. statement

```
CP
  C
    N P
    IP/S...
```

23) Yes-No question – **Inversion** – Move auxiliary:

Will Mary t leave? < +Q Mary will leave?

24) Wh question – **Inversion and Wh movement**

What should George t buy t? < +Q George should buy what?

Ex9. **Diagram the Deep and the Surface structures for:** Can a dog bark?, What must Megan do?

25) **Other transformations**

- **Verb raising:** Mary is leaving > Is Mary leaving? (is goes from V to I before moving to C)
- **Do-insertion:** Mary left > Did Mary leave? (do inserted into I before moving to C)
- **NP Movement (passivization):** The chef prepared the meal > The meal was prepared by the chef.
- **PP preposing:** With a telescope, the boy saw the man