Module 1:

* Challenges in NLP
* Stages of NLP
* NLP pipeline
* Preprocessing steps in NLP

Module 2:

* Morphology analysis using FST
* Porter Stemmer Algo
* Diff btw stemming and lemmatization
* Morpheme, Inflectional/derivational morphology
* Perform shift reduce parsing for the sentence**”- Ï saw a girl (**[**http://www.phontron.com/slides/nlp-programming-en-11-depend.pdf**](http://www.phontron.com/slides/nlp-programming-en-11-depend.pdf)

[**https://smerity.com/articles/2011/gss.html**](https://smerity.com/articles/2011/gss.html)**)**

* **Bigram /trigram/ SMOOTHING EXAMPLES(Asignment1)**
* **How N gram is used for spelling correction**
* **Application of N-gram**

**Module 3:**

* Rule based POS tagging
* Stochastic POS tagging, Issues –Multipletags & words, Unknown words.
* CFG defn and relevance
* Hidden Markov Model (HMM),:
* Maximum Entropy
* Conditional Random Field (CRF).
* Diff btw HMM/ MEMM/CRF
* Problems on HMM/MEMM –(teams+assignment2)

**Module 4:**

* Attachments of fragments of sentence with an example( Give a sentence and explain how NP ,VP etc gets attached.. draw the parse tree and explain)
* Word Sense Disambiguity (WSD) defn, How to resolve it-
* LEsk Algo
* Semantic Relations◦
* Hyponymy vs Hypernymy◦Synonymy◦Homonymy◦Polysemy◦Antonymy◦Holonymy vs Meronymy
* Basic defn of wordnet and tags

Module 5:

* Pragmatic analysis defn, example
* Discourse analysis defn, example
* Reference Resolution Problem
* Reference Resolution Approaches
* Anaphora resolution
* Pronoun Resolution- Hobbs Algo

(https://medium.com/analytics-vidhya/hobbs-algorithm-pronoun-resolution-7620aa1af538)

**Module 6**

Short note on:

* Machine translation
* Information retrieval
* Question answers system
* Summarization
* Machine translation
* Information retrieval
* Question answers system
* categorization,
* summarization
* sentiment analysis
* Named Entity Recognition,

For Problems related to HMM/MEMM, can refer the IIT Kharagpur NLP videos by Pawan Goyal

<https://youtu.be/Kvi6HzleQdo>

<https://youtu.be/u3924yvlWBo>

https://youtu.be/LFuuNYF7Pc0