EFL-U SCHOOL OF LANGUAGE SCIENCES
Sem – II/IV
MACL Courses for January – April 2020

MACL Courses

LS 121 - Phonology I	-	Dr. Hemanga Dutta
LS 174 - Introduction to Formal Language Theory and Automata	-	Dr. Utpal Lahiri
LS 251 - Semantics II	-	Dr. Utpal Lahiri
LS 281 - Natural Language Processing II	-	Dr. Rahul Balusu
LS 282 - Digital Signal Processing for Linguistics	-	Dr. Indranil Dutta
LS 283 - Issues in Computational Semantics	-	Dr. Rahul Balusu
LS 288 - Introduction to Human Sentence Processing	-	Dr. Atreyee Sharma
LS 382 - Articulatory Dynamics and Modeling	-	Dr. Indranil Dutta

Course Title	**Phonology I**
Course Code	**LS 121**
Semester	II/IV
No. of Credits	5
Name of the Faculty Member(s)	Dr. Hemanga Dutta
Course Description 150/200 words	The aim of this course is to provide students with an idea of what it means to do phonology. We will discuss the elements of phonological representation, have a look at phonological theory and get some hands-on experience with phonological analysis. Some of the topics that will be discussed are listed below: • Difference between phonetics and phonology • What is phonology? • Why phonology? • History of phonology • Classical phonemics: Identification of phonemes • Problems: Generative phonology • Distinctive features • Two levels of representation: Neutralization • Types of rules • Ordered rules • Feature geometry • Syllable and foot • Lexical Phonology • The notion of a cycle A detailed bibliography will be provided in the first session.
Evaluation Scheme	40= Assignment, 60= Written test.

Course Title	**Introduction to Formal Language Theory and Automata**
Course Code	**LS 174**
Semester	II/IV
No. of Credits	5
Name of Faculty Member(s)	Dr. Utpal Lahiri
Course Description: 150/200 words	This course is an advanced course on Mathematical Linguistics, primarily focused on introductory topics in Formal Language Theory and automata, plus a continuation of some topics in "Introduction to Mathematical Linguistics" (LS171). We will cover the syntax and semantics of modal logic, finite state automata and regular grammars, context free grammars and pushdown automata, context sensitive grammars, the Chomsky Hierarchy and Turing machines. If time permits, we will discuss recent results in Mathematical Linguistics about the expressive power of various components of the grammars of natural languages. Textbook (required): Partee, B., Alice ter Meulen and Robert Wall, 1993. *Mathematical Methods in Linguistics*, Springer Netherlands. We will also use material on specific topics from other textbooks if and when it's necessary.
Prerequisite	Introduction to Mathematical Linguistics (LS 171)
Evaluation Scheme	Internals (Homework's + midterm) 40%, Final 60%

Course title	Natural Language Processing II
Course code	**LS 281**
Semester	January – April 2020
No. of credits	5
Name of faculty member(s)	Dr. Rahul Balusu
Course description 150/200 words	Some of the topics we hope to cover in NLP-II are HMMs, n-grams, viterbi, forward algorithms, boolean retrieval, term vocabulary and postings lists, Index construction, scoring, term weighting and the vector space model, evaluation in information retrieval, relevance feedback and query expansion, clustering, web search basics, crawling, indexes, link analysis.

Course title	**Basic issues in Digital Signal Processing for Linguistics**
Course code	**LS 282**
Semester	II/IV
No. of credits	5
Name of faculty member(s)	Dr. Indranil Dutta
Course description 150/200 words	This course will bring together information from the engineering discipline of Digital Signal Processing (DSP), such as is relevant for linguistics, especially speech processing. We will simultaneously review material from both DSP and acoustic phonetics that will help advance our understanding of not only speech production and perception but also help us examine how our understanding of the basic mechanisms of digital and analog processing impacts current approaches to Automatic Speech Recognition (ASR) and Text-to-Speech Synthesis (TTS). The topics that we will cover will include the following: Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT), Quantization and Sampling, Digital Filters: High-Pass, Band-Pass and Band-Reject Filters, Glottal and Supra-glottal source modeling, Acoustics of vocal tract resonators, Basic auditory processing, Basic introduction to quantal theory, perturbation theory and source-filter theory, Noise spectra.

Course title	**Issues in Computational Semantics**
Course code	**LS 283**
Semester	January – April 2020
No. of credits	5
Name of faculty member(s)	Dr. Rahul Balusu
Course description 150/200 words	Handling Alternatives in Language: Bi-dimensional models, Exhaustification models, &Inquisitive models. The goal of the course is to give an overview of the use of alternatives in three semantic/pragmatic models of semantic computation: Bi-dimensional focus models (e.g. Rooth 1985, 1992, Beck 2006, Wagner 2006, Beaver and Clark 2008); Implicatures based Exhaustification models (e.g. Horn 1972, 1989, Gazdar 1979, Hirschberg 1985, Levinson 2000, Zimmermann 2000, Chierchia 2004, Sauerland 2004, Fox 2007, Geurts 2010); and information and inquisitive content based Inquisitive models (Groenendijk and Roelofsen 2009; Ciardelli 2009; Ciardelli and Roelofsen 2011, among others). "In producing and interpreting sentences, speakers constantly process information about other things that could have been said. The alternative linguistic forms that a speaker chooses not to use often play a significant part in the grammaticality and felicity of an utterance in a given context. As a result, both semantic and pragmatic theories need to provide an explicit model of alternatives and their relation to assertions. The idea that the well formedness of sentences may be determined by a selection among competing forms or interpretations plays a key part in many linguistic phenomena and has been at the core of several theoretical frameworks. In semantics and pragmatics, the issue became more prominent when an increasing number of phenomena were argued to have a semantics that makes direct reference to alternatives." "The proposed alternative-based accounts make use of alternative sets, but do not necessarily rely on a common set of assumptions regarding alternatives. As we will see shortly, there are at least three main issues on the basis of which alternative-based systems can be distinguished, namely how they conceive (i) the source of alternatives, (ii) the mechanism underlying the generation of propositional alternatives, and (iii) the relation between alternatives and the assertion." -from A.Falaus (2013),*Alternatives in Semantics.*

Course title	**Introduction to Human Sentence Processing**
Course code	**LS 288**
Semester	II/IV
No. of credits	5
Name of faculty member(s)	Dr. Atreyee Sharma
Course description 150/200 words	When a written or a spoken sentence is encountered, what kinds of processes do we use to understand or comprehend it? This course aims to answer this question in the light of evidence from a wide range of experimental techniques, including eye tracking, EEG recordings and reading time measurement. Basic questions covered are: I. What is the role of prediction in sentence processing II. How are ambiguous sentences processed? III. How does sentence processing interact with the working memory processes? IV. To what extent do we follow grammatical rules when we interpret a sentence? Hands on experience with DMDX and setting up of small experiments to test sentence processing are also included.

Course title	**Articulatory Dynamics and Modeling**
Course code	**LS 382**
Semester	II/IV
No. of credits	5
Name of faculty member(s)	Dr. Indranil Dutta
Course description 150/200 words	The aim of this course is to survey the literature on articulatory phonology, and other dynamical phonological models. Within these models the basic units or atoms of phonological structure are articulatory gestures and not linear concatenations of abstract entities such as segments, phonemes or feature bundles. On the basis of kinematic articulatory data and the gestural scores, articulatory modeling relies heavily on the dynamic nature of speech production and perception.

Course title	**Semantics II**
Course code	**LS 251**
Semester	II/IV
No. of credits	5
Name of faculty member(s)	Dr. Utpal Lahiri
Course description 150/200 words	This course is a continuation of Formal Semantics I (LS 152), and is intended to give a basic introduction to advanced topics not covered in LS 152. Topics include: Generalized Quantifier Theory; Lambda Calculus; Intensional Phenomena including but not limited to: modality, propositional attitudes, tense, aspect; Anaphora and Indexicals. Prerequisite: LS 152 or equivalent. Recommended texts: Chierchia, G. and S. McConnell-Ginet (2000). *Meaning and Grammar*. MIT Press (2nd Edition) Heim, I. and von Fintel (2007). *Notes on Intensional Semantics*. Ms., MIT (downloadable)
Evaluation	Home works (25%), Midterm Exam (25%), Final Exam (50%).