

City University of Hong Kong
Course Syllabus

offered by Department of Linguistics and Translation
with effect from Semester A 2017/18

Part I Course Overview

Course Title: Computational Linguistics

Course Code: LT3233

Course Duration: One Semester

Credit Units: 3

Level: B3

Proposed Area: Arts and Humanities
(for GE courses only) Study of Societies, Social and Business Organisations
 Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: (i) CTL2231 Introduction to Language Technology, LT2231 Introduction to Language Technology and (ii) CTL2201 Introduction to Linguistics, LT2201 Introduction to Linguistics or CTL2229 Linguistics I, LT2229 Linguistics I or CTL2290 Introduction to Language Studies, LT2290 Introduction to Language Studies
(Course Code and Title)

Precursors: Nil
(Course Code and Title)

Equivalent Courses: CTL3233 Computational Linguistics
(Course Code and Title)

Exclusive Courses: Nil
(Course Code and Title)

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims at introducing students to some of the major issues and solutions in natural language processing. The underlying computational properties of natural languages are considered at the lexical, syntactic, and semantic level from linguistic and statistical perspectives. Both traditional rule-based context-free models and modern corpus-based quantitative techniques will be discussed. Selected natural language applications will also be introduced. Concepts taught in class will be reinforced by hands-on practical exercises.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick ✓ where appropriate)		
			A1	A2	A3
1.	Identify the major areas of study in computational linguistics and natural language processing (NLP)	30%	√	√	
2.	Explain the major issues in NLP and discuss, competently and critically, computer programming for different approaches to their solution in general and with particular reference to English and Chinese	40%	√	√	√
3.	Write computer programs to compile and use lexical, syntactic and semantic resources to tackle various NLP subtasks	30%		√	√
		100%			

* If weighting is assigned to CILOs, they should add up to 100%.

Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

Final details will be provided to students in their first week of attendance in this course.

TLA	Brief Description	CILO No.						Hours/week (if applicable)
		1	2	3				
1	Lectures to explain the major issues in NLP and introduce computer programming for different approaches to their solution. Interaction between teacher and students is expected.	✓	✓					1.5 hours
2	Demonstration of computer programming for handling various NLP subtasks to students in lectures and/or tutorials.		✓					0.5 hour
3	Teacher-facilitated class/group discussions on the technical issues and the strengths and weaknesses of different approaches to NLP subtasks in lectures and/or tutorials.		✓					
4	Hands-on exercises in tutorials on computer programming to handle various NLP subtasks, which might involve the design and preparation of various linguistic resources (e.g. writing context-free rules for parsing) and/or simple program fragments. (We assume that the students' main working programming language is Java.)			✓				1 hour

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Final details will be provided to students in their first week of attendance in this course.

Assessment Tasks/Activities	CILO No.						Weighting*	Remarks
	1	2	3					
Continuous Assessment: 50%								
Quizzes on the concepts of computer programming and on the major issues in natural language processing.	✓	✓					30%	
Demonstration of running computer programs for various NLP subtasks.	✓	✓						
Assignments and practical exercises involving computer programming for various NLP subtasks			✓				20%	
Examination: 50% (duration: 2 hours, at the end of the semester) (CILO No. 1, 2, 3)								
							100%	

* The weightings should add up to 100%.

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Quizzes	Knowledge, attitude creativity and performance in presenting and completing demons/assignments	<ul style="list-style-type: none"> • Excellent knowledge of major issues in language processing and various approaches to their solution. • Excellent, creative application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Good knowledge of major issues in language processing and various approaches to their solution. • Good application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Adequate knowledge of major issues in language processing and various approaches to their solution. • Fair application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Basic familiarity with the subject matter. • Marginal ability to apply basic computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Poor familiarity with the subject matter. • Poor ability or fail to apply computing and programming knowledge to basic language processing subtasks.
2. Demonstration of running computer programs	Knowledge, attitude creativity and performance in presenting and completing demons/assignments	<ul style="list-style-type: none"> • Excellent knowledge of major issues in language processing and various approaches to their solution. • Excellent, creative application of computing and programming knowledge to basic language processing subtasks. • Very active participation. 	<ul style="list-style-type: none"> • Good knowledge of major issues in language processing and various approaches to their solution. • Good application of computing and programming knowledge to basic language processing subtasks. • Active participation. 	<ul style="list-style-type: none"> • Adequate knowledge of major issues in language processing and various approaches to their solution. • Fair application of computing and programming knowledge to basic language processing subtasks. • Adequate participation. 	<ul style="list-style-type: none"> • Basic familiarity with the subject matter. • Marginal ability to apply basic computing and programming knowledge to basic language processing subtasks. • Marginal participation. 	<ul style="list-style-type: none"> • Poor familiarity with the subject matter. • Poor ability or fail to apply computing and programming knowledge to basic language processing subtasks. • Poor participation.

3. Assignments and practical exercises	Knowledge, attitude creativity and performance in presenting and completing demonstrations/assignments	<ul style="list-style-type: none"> • Excellent knowledge of major issues in language processing and various approaches to their solution. • Excellent, creative application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Good knowledge of major issues in language processing and various approaches to their solution. • Good application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Adequate knowledge of major issues in language processing and various approaches to their solution. • Fair application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Basic familiarity with the subject matter. • Marginal ability to apply basic computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Poor familiarity with the subject matter. • Poor ability or fail to apply computing and programming knowledge to basic language processing subtasks.
4. Examination	Knowledge, attitude creativity and performance in presenting and completing demonstrations/assignments	<ul style="list-style-type: none"> • Excellent knowledge of major issues in language processing and various approaches to their solution. • Excellent, creative application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Good knowledge of major issues in language processing and various approaches to their solution. • Good application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Adequate knowledge of major issues in language processing and various approaches to their solution. • Fair application of computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Basic familiarity with the subject matter. • Marginal ability to apply basic computing and programming knowledge to basic language processing subtasks. 	<ul style="list-style-type: none"> • Poor familiarity with the subject matter. • Poor ability or fail to apply computing and programming knowledge to basic language processing subtasks.

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

Natural language processing: Tokenisation, Morphological analysis, Part-of-speech tagging, Context-free rules, Parsing, Semantic representation, Disambiguation, Rule-based methods, Corpus-based methods, Statistical methods

Natural language applications: Machine translation, Information retrieval, Information extraction, Natural language generation

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Lecture notes/slides for the course
2.	Selected topics of Java programming from the Java Tutorials Online provided by Oracle at https://docs.oracle.com/javase/tutorial/
3.	Online API (Application Programming Interface) specification for selected Java classes needed in the programming for this course

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Advanced and/or related topics of Java programming from the Java Tutorials Online provided by Oracle at https://docs.oracle.com/javase/tutorial/
2.	Allen, J. (1995) <i>Natural Language Understanding</i> . Redwood City, CA: Benjamin/Cummings.
3.	Hammond, M. (2002) <i>Programming for Linguists: Java Technology for Language Researchers</i> . Malden, MA: Blackwell Publishers.
4.	Jurafsky, D. and Martin, J.H. (2000) <i>Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition</i> . Upper Saddle River, NJ: Prentice Hall.
5.	Manning, C.D. and Schütze, H. (1999) <i>Foundations of Statistical Natural Language Processing</i> . Cambridge, MA: The MIT Press.