Course Syllabus

1. **Program of Study** Bachelor of Science (Computer Science)
   Faculty/Institute/College Mahidol University International College
   Mahidol University

   Course Code ICCS 454 **Course Title** Natural Language Processing and Applications

2. **Number of Credits** **4 (Lectures/lab)** (4 - 0)

3. **Prerequisite(s)** ICCS 321

4. **Type of Course** Elective

5. **Trimester / Academic Year** Trimester III / Year 2005 - 2006

6. **Course Description**
   This course will cover: levels of NLP, speech (phonetics, phonology); grammar (morphology, syntax); meaning (semantics, pragmatics); applications (text-to-speech, speech-to-text, parsing, MT, NL interfaces). The emphasis will be on the background needed to understand practical applications of speech and natural language processing.

7. **Course Objective(s)**
   By the end of the course students should be able to:
   - Be knowledgeable in various approaches—symbolic, empirical, and artificial network—to Natural Language Processing
   - Apply appropriate techniques to NLP problem-solving situations
   - Compare and contrast techniques in each approach

8. **Course Outline**

Week	Topic		Instructor
	Lecture	Hour	
1	Introduction to Symbolic Approaches, Tokenisation and Sentence Segmentation, Lexical Analysis, Parsing Techniques	4	Dr. Maruf Hasan
2	Semantic Analysis, Discourse Structure and Intention Recognition, Natural Language Generation	4	
3	Intelligent Writing Assistance, Database Interface, Information Extraction	4	
4	Generation of Reports from Databases, Generation of Multimedia Presentations, Machine Translation, Dialog Systems	4	
5	Introduction to Empirical Approaches, Corpus Creation for Data-Intensive Linguistics (+ Mid-term Exam I)	4	
6	Part-of-Speech Tagging, Alignment , Contextual Word Similarity, Computing Similarity, Collocations	4	
7	Statistical Parsing, Authorship Identification and Computational Stylometry, Lexical Knowledge	4	

Week	Topic		Instructor
	Lecture	**Hour**	
8	Introduction to Artificial Network Approaches, Knowledge Representation (+ Mid-term exam II)	4	
9	Grammar Inference, Automata Induction, ANN-based NLP, Character Recognition, Compressing Texts with Neural Nets	4	Dr. Muraf Hasan
10	Neural Architectures for Information Retrieval and Database Query, Text Data Mining, Text and Discourse Understanding	4	
11	Review	4	
	Total	44	

9. Teaching Method(s)

Lectures, in-class practical exercises, discussion, and self-study

10. Teaching Media

Text and teaching materials, Powerpoint, and handouts

11. Measurement and Evaluation of Student Achievement

Assessment made from stated criteria: students with 85% obtain grade A

12. Course Evaluation

1. Participation 5%
2. Written & programming assignments (×5) 25%
3. Mid-term exams 40%
4. Final exam 40%

13. Reference(s)

Dale, R., et al., 2000. Handbook of Natural Language Processing. Marcel Dekker, New York, NY.

14. Instructor(s)

Dr. Maruf Hasan

15. Course Coordinator

Dr. Maruf Hasan