



Course Specifications (Postgraduate Degree)

Course Title:	Natural Language Processing
Course Code:	511PMAI-3
Program:	Professional Master of Artificial Intelligence (PMAI)
Department:	Computer Science
College:	Computer Science and Information Systems
Institution:	Najran University

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A. Course Identification

1. Credit hours:	3 Credit hours (2 lecture + 2 Laboratory)
2. Course type	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Elective
3. Level/year at which this course is offered:	Year 2/ Level 5
4. Pre-requisites for this course (if any):	N/A
5. Co-requisites for this course (if any):	N/A

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	50	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
1	Lecture	30
2	Laboratory/Studio	20
3	Seminars	
4	Others (specify)	
Total		50

B. Course Objectives and Learning Outcomes

1. Course Description

The intent of the course is to present the study of computing systems that can process, understand, or communicate in human language. This course covers a wide range of tasks in Natural Language Processing (NLP) from basic to advanced: grammatical formalisms, parsing methods, text understanding, to name a few. Upon completing, you will be able to recognize NLP tasks in your day-to-day work, propose approaches, and judge what techniques are likely to work well.

2. Course Main Objective

- To introduce students the challenges of empirical methods for natural language processing (NLP) applications.
- To introduce basic mathematical models and methods used in NLP applications to formulate computational solutions.
- To provide students with the knowledge on designing procedures for natural language resource annotation and the use of related tools for text analysis and hands on experience of using such tools.
- To introduce students research and development work in information retrieval, information extraction, and knowledge discovery using different natural language resources.
- To give an overview of the major technologies in speech recognition and synthesis including tools for acoustic analysis and hands on experience of using such tools.
- To give students opportunities to sharpen their programming skills for computational linguistics applications

3. Course Learning Outcomes

Course Learning Outcomes (CLOs)		Aligned PLOs*
1	Knowledge and Understanding	
1.1	Understand approaches to syntax and semantics in NLP.	K1
1.2	Understand approaches to discourse, generation, dialogue and summarization within NLP	K1, K2
1.3	Understand current methods for statistical approaches to machine translation	K1
1.4	Recognize the application of NLP in real world applications and identify current tools for NLP.	K1, K2
2	Skills :	
2.1	Design, implement and evaluate methods for NLP and its application such as information retrieval and information extraction.	S1,S2,S3
2.2	Design, implement and evaluate relevant machine learning techniques for NLP	S3
2.3	Solve problems using systematic ways and learning independently.	S2
2.4		
2...		
3	Values:	
3.1		
3.2		
3.3		
3...		

* Program Learning Outcomes

C. Course Content

No	List of Topics	Contact Hours
1	Basic Text Processing	4

2	Regular Expressions, Text Normalization, Edit Distance	4
3	N-gram Language Models	4
4	Word Classes and Part-of-Speech Tagging	4
5	Hidden Markov Model and Maximum Entropy Models	4
6	Grammar Formalisms and Treebanks	4
7	Parsing with Context Free Grammars	4
8	Statistical Parsing and Probabilistic Context Free Grammars	4
9	Lexical Semantics and Word Sense Disambiguation	4
10	Semantic Role Labeling and Semantic Parsing	4
11	Information Extraction	4
12	Question Answering and Summarization	4
13	Sentiment Analysis	4
...		
Total		50

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Understand approaches to syntax and semantics in NLP.	Lectures,	Quiz, Assignments, Midterm Examination, Final Examination
1.2	Understand approaches to discourse, generation, dialogue and summarization within NLP	Lectures, Lab	Quiz, Assignments, Midterm Examination, Final Examination
1.3	Understand current methods for statistical approaches to machine translation	Lectures, Lab, Case studies	Quiz, Assignments, Project report
1.4	Recognize the application of NLP in real world applications and identify current tools for NLP.	Lectures, Lab, Case studies	Quiz, Assignments, Project report
2.0	Skills		
2.1	Design, implement and evaluate methods for NLP and its application such as information retrieval and information extraction.	Lectures, Lab	Quiz, Assignments, Midterm Examination, Final Examination
2.2	Design, implement and evaluate relevant machine learning techniques for NLP	Lectures, Lab, Case studies	Midterm Examination, Final Examination
2.3	Solve problems using systematic ways and learning independently.	Group discussion project	Project Report, Project presentation
2.4			
...			
3.0	Values		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.1			
3.2			
...			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz1	3 rd week	5%
2	Midterm	6 th week	20%
3	Theory Assignments	2 th , 5 th , 8 th , 10 th weeks	10%
4	Lab Assignments	7 th week	10%
5	Quiz2	10 th week	5%
7	Project	11 th week	10%
8	Final Exam	12 th or 13 th week	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Weekly office hours for student counseling and support + Appointments
- Weekly academic advising hours
- Extra weekly 2 office hours prior to exams.
- Tutorials are also provided to the students

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	1- Dan Jurafsky and James H. Martin, Speech and Language processing, 2 nd Addition, Prentice Hall, 2008 2- Kumar, Ela. Natural language processing. IK International Pvt Ltd, latest edition. 3- Lehnert, Wendy G. Strategies for natural language processing. Psychology Press, latest edition 4- Clark, Alexander, Chris Fox, and Shalom Lappin, eds. The handbook of computational linguistics and natural language processing. John Wiley & Sons, latest edition.
Essential Reference Materials	Recent Papers in NLP related journals
Electronic Materials	

Other Learning Materials	MATLAB, Python or similar software
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2. Educational and research Facilities and Equipment Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	One classroom One Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, PCs, Whiteboard, Internet connection, Anti-plagiarism software
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Instructor	Direct
Extent of achievement of course learning outcomes	Instructor	Direct

Evaluation Areas/Issues (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Computer Science Departmental Council
Reference No.	14440203-0185-00002
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