CSC/CPE 582 Introduction to Natural Language Processing

1. CSC/CPE 582 Introduction to Natural Language Processing

2. credit units 4  contact hours 6

3. Course Coordinator: Foaad Khosmood


5. a. Course Description: Classic Natural Language Processing systems and techniques; Review of recent advancements in the subject. Topics selected from: Parsing, Tagging, Word-Sense Disambiguation, Natural Language Generation, Data Mining, Voice Recognition, Vocalization, Knowledge Management, Semantic Networks, Stylistics and Machine Learning. 3 lectures, 1 laboratory.

b. Prerequisite: CPE/CSC 480 or CPE/CSC 466; and Graduate Standing or consent of instructor.

c. Required/Elective/Selective Elective for CPE, CSC, EE, SE

<table>
<thead>
<tr>
<th></th>
<th>CPE</th>
<th>CSC</th>
<th>EE</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Selective Elective</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

6. a. Course Goals/Outcomes

The student will be able to:

- Write programs to perform basic syntactic and semantic decomposition of digitized text in various forms using Python programming language.
- Interface with online tools and references to enhance natural language understanding and analysis.
- Be familiar with algorithms and programming techniques for contemporary Natural Language Processing.
- Be familiar with current research in NLP and Computational Linguistics through reading and critically discussing peer-reviewed articles.
- Produce a hypothesis-testing research paper, or a survey paper on an open problem in the field.
- Present critical reviews of approaches to coordinated and/or cooperative problem solving systems through a taxonomy of evaluation criteria.
b. **How Student Outcomes addressed**
(“B” = Basic level, “I” = Intermediate level, “A” = Advanced level)

<table>
<thead>
<tr>
<th></th>
<th>3a</th>
<th>3b</th>
<th>3c</th>
<th>3d</th>
<th>3e</th>
<th>3f</th>
<th>3g</th>
<th>3h</th>
<th>3i</th>
<th>3j</th>
<th>3k</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>I</td>
<td>A</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>SE/</td>
<td>A</td>
<td>I</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>I</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>CPE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. **Major Topics Covered: (number of lecture hours each)**
   - NLP systems (1)
   - Python programming (3)
   - Sentence/word tokenization and processing (1)
   - Ngrams and statistical evaluation of text (1)
   - Part of speech tagging (2)
   - Parsing theory and methods (3)
   - Statistical NLP models (1)
   - Classification and Machine Learning in NLP (3)
   - Word-sense-disambiguation (2)
   - Processing large corpora (1)
   - Speech processing (1)
   - Vocalization (1)
   - Natural Language Generation (1)
   - Significance analysis for research results (1)
   - Contemporary research in NLP (8)