COURSE OUTLINE

(1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>School of Engineering, University of Patras</th>
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<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>Department of Computer Engineering and Informatics</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>Undergraduate Core Elective</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>CEID_NE5657</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>WINTER</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>LANGUAGE TECHNOLOGY</td>
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INDEPENDENT TEACHING ACTIVITIES

If credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits.

| Lectures, Tutorials, Lab Sessions (Project) | 2, 1, 2 | 5 |

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).

<table>
<thead>
<tr>
<th>COURSE TYPE</th>
<th>Specialised general knowledge and skills development.</th>
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PREREQUISITE COURSES:

There are no prerequisite courses. Recommended background knowledge: Artificial Intelligence (CEID_NY451), Algorithms (CEID_NY205) and Databases (CEID_NY334).

LANGUAGE OF INSTRUCTION and EXAMINATIONS:

Greek. Instruction may be given in English if foreign students attend the course.

IS THE COURSE OFFERED TO ERASMUS STUDENTS: YES

COURSE WEBSITE (URL)

https://eclass.upatras.gr/courses/CEID1132/

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A
- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Learning outcomes:

At the end of this course the student will be able to:

- to present the basic principles and concepts of natural language processing
- describe the available methodologies for processing and displaying textual data
- describe the techniques currently used by popular applications in the fields of information retrieval, knowledge extraction, text categorization, automatic text summary, automatic translation
- Design and implement algorithms for textual data analysis, attribute extraction and classroom training.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Project planning and management
- Respect for difference and multiculturalism
- Respect for the natural environment
- Showing social, professional and ethical responsibility and sensitivity to gender issues
- Criticism and self-criticism
- Team work
- Production of free, creative and inductive thinking
- Working in an international environment
- ....
- Working in an interdisciplinary environment
- Others...
Production of new research ideas
Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making
Team work
Project planning and management
Production of free, creative and inductive thinking
Production of new research ideas

(3) SYLLABUS

First Part
- Introduction to the use of techniques and algorithms for effective processing and analysis of the natural language
- Techniques for the analysis and the morphosyntactic processing of text
- Syntax analysis
- Semantic analysis
- Pragmatic analysis
- Methods for the representation of textual data
- Effective data indexing methods
- Design and use of indexes and lexical resources
- Analysis and knowledge extraction from collections of textual data

Second Part
- Techniques and algorithms for semantic disambiguation
- Clustering and thematic categorization
- Principles of question answer systems
- Semantic text representation, Vector Space Model
- Techniques for the Automatic summarization of text, Machine translation.

Third Part
- Techniques for the classification of textual data.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face-to-face, Distance learning, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>Information and Communications Technologies are used in communicating with students. We use: eclass, email and forum.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</td>
</tr>
<tr>
<td>Activity</td>
<td>Semester workload</td>
</tr>
<tr>
<td>Lectures</td>
<td>60</td>
</tr>
<tr>
<td>Tutorials</td>
<td>30</td>
</tr>
<tr>
<td>Lab Sessions (Projects)</td>
<td>60</td>
</tr>
<tr>
<td>Course total</td>
<td>150</td>
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STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure
- Project development: development of an integrated system in a specific field of natural language processing (50% of the total grade)
- Written examination (50% of the total grade)
Specifically-defined evaluation criteria are given, and if and where they are accessible to students.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
  - Natural Language Processing with Python, Ewan Klein, Steven Bird, 2009 ISBN: 0596516495