# Faculty of Computers and Information Technology

## Natural Language Processing

## Information :

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| **Course Code :** | CSC 443 | **Level** : | Undergraduate | **Course Hours :** | 3.00- Hours |

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| **Department :** | Department of Computer Science |

## Instructor Information :

| Title | Name | Office hours |
|---|---|---|
| Associate Professor | Osama Fathy Saleh Hegazy | 2 |
| Teaching Assistant | Mahinda Mahmoud Samy Ahmed Zaki Zidan | 1 |

## Area Of Study :

Fundamental concepts and ideas in natural language processing (NLP), also known as computational linguistics. It develops an in-depth understanding of both the algorithms available for the processing of linguistic information and the underlying computational properties of natural languages. Word level, syntactic, and semantic processing from both a linguistic and an algorithmic perspective are considered

## Description :

Introduction to computational linguistics in general and natural language processing in particular. Reviewing background material in linguistics and surveying works on topics such as sub-languages, syntactic analysis, context, discourse analysis, application or world knowledge, machine translation, and text generation. Arabic computational linguistics

## Course outcomes :

### a.Knowledge and Understanding: :

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| 1 - | Identify and discuss the characteristics of different NLP techniques |
| 2 - | Identify and discuss the characteristics of different machine learning techniques used in NLP |
| 3 - | Understand basic processes and representations used in syntax, semantics, and other components of natural language processing |
| 4 - | Understand the design of tools for basic NLP tasks such as tagging and partial parsing and be able to apply them to text |
| 5 - | Understand some of the basic principles of the representation of linguistic meaning and interpretative inference |

### b.Intellectual Skills: :

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| 1 - | Learn about the areas in which natural language processing is being applied to problems today. |
| 2 - | Be able to describe and discuss the potential and limitations of NLP techniques for applications such as machine translation, question answering, information retrieval and information extraction |

### c.Professional and Practical Skills: :

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| 1 - | Be able to implement programs for NLP algorithms and techniques |

### d.General and Transferable Skills: :

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| 1 - | discuss the characteristics of different NLP techniques |

| 2 - | discuss the characteristics of different machine learning techniques used in NLP |
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| 3 - | Be able to describe and discuss the potential and limitations of NLP techniques for applications such as machine translation, question answering, information retrieval and information extraction |
| 4 - | Be able to describe and discuss some of the proposed ideas in any included topic |
| 5 - | Be able to provide his own perspective considering selections of the published ideas |

## Course Topic And Contents :

| Topic | No. of hours | Lecture | Tutorial / Practical |
|---|---|---|---|
| Introduction To NLP | 3 | 2 | 2 |
| Finite State Automata | 3 | 2 | 2 |
| Regular Expressions | 3 | 2 | 2 |
| Words and Transducers | 3 | 2 | 2 |
| Formal Grammar of English and Syntactic Parsing | 3 | 2 | 2 |
| Semantics and Pragmatics | 3 | 2 | 2 |
| Computational Semantics | 3 | 2 | 2 |
| Computational Discourse | 3 | 2 | 2 |
| Applications (Information Retrieval) | 3 | 2 | 2 |
| Knowledge Discovery | 3 | 2 | 2 |
| Text Mining | 3 | 2 | 2 |
| Summarization | 3 | 2 | 2 |
| Query Answering | 3 | 2 | 2 |

## Teaching And Learning Methodologies :

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| Practical training |
| Lectures |
| Exercises |
| Open Discussion |
| Self Studies |
| Web-Site searches |
| Case Study |
| Projects |
| Presentation |

## Course Assessment :

| Methods of assessment | Relative weight % | Week No | Assess What |
|---|---|---|---|
| Final Exam | 40.00 | 15 | Knowledge and Understanding |
| Mid Term Exams | 30.00 | 7 | Knowledge and Understanding |
| Project Discussion | 10.00 | 13 | Professional and Practical Skills |
| Quizes | 10.00 | 3 | Knowledge and Understanding |

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|---|---|---|---|
| Selected Subjects Discussion | 5.00 | 8 | General and Transferable Skills |
| Self Study Discussion | 5.00 | 12 | Intellectual Skills |