COURSE OVERVIEW IT0016
AI Natural Language Processing

Course Title
AI Natural Language Processing

Course Date/Venue
Session 1: June 15-19, 2025/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai UAE
Session 2: November 10-14, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
IT0016

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Objectives

This hands-on, highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of AI Natural Language Processing. It covers the importance of natural language processing (NLP) and the fundamentals of text processing; the regular expressions (Regex) for text processing, word embeddings, sentence parsing and dependency analysis; the bag of words (BoW) and TF-IDF representations, N-grams and feature extraction; the sentiment analysis with machine learning, named entity recognition (NER), text categorization, word embeddings and contextual representation; and the deep learning for NLP, recurrent neural networks (RNNs) and long short-term memory (LSTM) networks.

During this interactive course, participants will learn the transformer models in NLP, training a text generation model with GPT and text summarization techniques; question answering systems with NLP and machine translation with NLP; the machine translation with NLP, fake news detection and text moderation and deploying NLP models in production; running NLP models on mobile devices, optimizing NLP models for edge AI and using TensorFlow lite for on-device NLP; and addressing bias in NLP models, privacy concerns in AI-driven text processing including fairness and transparency in AI-generated text.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on artificial intelligence natural language processing
- Discuss the importance of natural language processing (NLP) and the fundamentals of text processing
- Recognize regular expressions (Regex) for text processing, word embeddings, sentence parsing and dependency analysis
- Describe bag of words (BoW) and TF-IDF representations, N-grams and feature extraction
- Carryout sentiment analysis with machine learning, named entity recognition (NER), text categorization, word embeddings and contextual representation
- Discuss deep learning for NLP, implement recurrent neural networks (RNNs) and long short-term memory (LSTM) networks
- Describe transformer models in NLP, train a text generation model with GPT and apply text summarization techniques
- Recognize question answering systems with NLP and apply machine translation with NLP
- Carryout machine translation with NLP, fake news detection and text moderation as well as deploy NLP models in production
- Run NLP models on mobile devices, optimize NLP models for edge AI and use TensorFlow lite for on-device NLP
- Address bias in NLP models and discuss privacy concerns in AI-driven text processing including fairness and transparency in AI-generated text

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of AI natural language processing for data scientists and machine learning engineers, software engineers/developer, AI/ML researchers, business analysts and data analysts, product managers, linguists and other technical staff.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Taher El Shaikh is an **International Expert** in **Information Technology** Management, **Information Analysis**, **Information Security & Control Structures**, **Cyber-Security**, **SCADA Security**, **PLC** Design, **Telecommunications**, Mobile Protocols, 4G LTE, GSM/UMTS, CMDA2000, WIMAX Technology, HSPA+, **Alarm Management** System, **Computer Architecture**, Logic & Microprocessor Design, Embedded Systems Design plus **Computer Networking** with **CISCO**, **Network Communication**, **Industrial Digital Communication**, Designing Telecommunications Distribution System, **Electrical** Engineering, **WiMAX Broadband Wireless** System, TT Intranet & ADSL Network, TT Web & Voicemail, Off-site ATM Network, IT Maintenance, Say2000i, IP Phone, National Address & ID Automation, **Electricity Distribution Network**, **Customs Network** & **Maintenance**, **LAN** & **WAN Network**, UYAP Network, **Network Routing Protocols**, **Multicast Protocols**, **Network Management Protocols**, **Mobile** & **Wireless Networks**, **Digital Signal Processing**, Microsoft Office, Windows 7, Windows 8 & Windows 10, Windows Server 2008 & 2012, **Network Security** Administration, **Network Installation**, **Electronic Data Operations**, **Web Application Security**, **Network Security**, **DLP** (**Data Loss Prevention**), **IT Service** Management, **Communication System**, **Disaster Recovery & Back-Up Procedures**, **Documentation** Management, **Material Research & Compilation**, **Project Management** and **Office Administration**. Further, he is also well-versed in strategic planning & problem solving, communication skills, organization procedure & contracting and material management. He is currently the **General Manager** of Logixpro Technology Systems wherein he is the manages and directs the company's marketing strategy and other business initiatives as well as spearheads the development, communication and implementation of effective growth strategies and processes across the company.

Dr. Taher is actively involved in solving and responding to network and database concerns, troubleshoot and maintain the servers and other IT equipment and ensuring that all members of the team comply with work instructions, company rules, policies and procedures; performing and managing complex and sensitive professional projects and public relations.

Dr. Taher has a **Bachelor** degree in **Information Technology**. Further, he is also an **IBM Professional** and **CIW Associate** & **Professional**. He has delivered numerous trainings, courses, workshops, seminars and conferences globally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Understanding Natural Language Processing (NLP)*** *Definition & Importance of NLP • Applications of NLP in AI & Real-World Scenarios • Key Challenges in NLP (Ambiguity, Context understanding) • Overview of NLP Libraries (NLTK, SpaCy, Transformers)*
0930 – 0945	*Break*
0945 – 1040	***Fundamentals of Text Processing*** *Tokenization: Word versus Sentence Tokenization • Stop-Word Removal & Why It Matters • Stemming versus Lemmatization • Part-of-Speech (POS) Tagging*
1040 – 1135	***Regular Expressions (Regex) for Text Processing*** *Basics of Regex in Python • Extracting Patterns from Text • Named Entity Recognition Using Regex • Cleaning Text Using Regex Patterns*
1135 - 1230	***Understanding Word Embeddings*** *Difference Between Word Embeddings & One-Hot Encoding • Introduction to Word2Vec, GloVe & FastText • Contextual Embeddings & Their Advantages • Visualizing Word Embeddings Using t-SNE*
1230 – 1245	*Break*
1245 – 1335	***Sentence Parsing & Dependency Analysis*** *Syntax Trees in NLP • Dependency Parsing for Understanding Sentence Structure • Named Entity Recognition (NER) Using SpaCy • Visualizing Dependencies in Sentences*
1335 - 1420	***Hands-On: Preprocessing Text with NLP Libraries*** *Tokenizing & Lemmatizing Text Using NLTK & SpaCy • Applying Regex for Text Cleaning • Implementing POS Tagging & Named Entity Recognition • Visualizing Dependency Parsing in NLP*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Bag of Words (BoW) & TF-IDF Representations*** *Concept of Bag of Words in Text Classification • Limitations of BoW & Why TF-IDF Is Better • Implementing TF-IDF Using Scikit-Learn • Comparing BoW versus TF-IDF for Document Classification*
0830 – 0900	***N-Grams & Feature Extraction*** *Understanding Unigrams, Bigrams & Trigrams • Implementing N-grams for NLP Tasks • Feature Extraction Using CountVectorizer • Selecting the Best N-Grams for Classification*
0900 – 0915	*Break*
0915 – 1100	***Sentiment Analysis with Machine Learning*** *Understanding Sentiment Analysis Applications • Implementing Sentiment Analysis Using Naïve Bayes • Using Support Vector Machines (SVM) for Sentiment Classification • Evaluating Sentiment Analysis Models*
1100 – 1230	***Named Entity Recognition (NER) & Text Categorization*** *Introduction to Named Entity Recognition (NER) • Implementing NER Using SpaCy • Text Classification Using Machine Learning • Applications of NER in Business & Finance*
1230 – 1245	*Break*
1245 – 1335	***Word Embeddings & Contextual Representation*** *Word2Vec versus TF-IDF • Pretrained Word Embeddings (GloVe, FastText) • Contextual Embeddings Using BERT • Comparing Traditional versus Transformer-Based Embeddings*
1335 - 1420	***Hands-On: Implementing Machine Learning for NLP*** *Training a Sentiment Analysis Model Using TF-IDF • Implementing NER Using SpaCy & Scikit-Learn • Training a Text Classification Model Using Naïve Bayes • Evaluating Models Using Accuracy & F1-Score*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Deep Learning for NLP*** *Why Deep Learning Is Needed for NLP • Understanding Sequence Data in NLP • Introduction to RNNs, LSTMs & GRUs • Comparison of Deep Learning versus Traditional ML in NLP*
0830 – 0900	***Implementing Recurrent Neural Networks (RNNs)*** *Understanding the Structure of RNNs • Training an RNN for Text Classification • Challenges of Vanishing Gradient in RNNs • Improving RNN Performance with Dropout & Batch Normalization*
0900 – 0915	*Break*
0915 – 1100	***Long Short-Term Memory (LSTM) Networks*** *Why LSTMs are Better Than Traditional RNNs • Implementing LSTM for Sentiment Analysis • Hyperparameter Tuning for LSTM Models • Using Bi-Directional LSTMs for Text Processing*
1100 – 1230	***Transformer Models in NLP*** *Understanding the Attention Mechanism • How Transformers Revolutionized NLP • Overview of Popular Transformer Architectures (BERT, GPT) • Transfer Learning with Transformers*

1230 – 1245	*Break*
1245 – 1335	***Training a Text Generation Model with GPT*** *Introduction to GPT-2/GPT-3 for Text Generation • Fine-Tuning GPT Models on Custom Datasets • Using Hugging Face Transformers for Text Generation • Applications of Text Generation in AI*
1335 - 1420	***Hands-On: Implementing LSTMs & Transformers for NLP*** *Training an LSTM Model for Text Generation • Implementing BERT Embeddings for Classification • Using GPT for Text Summarization • Comparing Traditional Deep Learning with Transformers*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Text Summarization Techniques*** *Extractive versus Abstractive Summarization • Implementing Extractive Summarization Using NLP Models • Using Transformer Models for Abstractive Summarization • Applications in News & Document Summarization*
0830 – 0930	***Question Answering Systems with NLP*** *Overview of Question Answering (QA) Tasks • Training a QA System Using BERT • Fine-Tuning Transformer Models for QA • Applications in Customer Support & Virtual Assistants*
0930 – 0945	*Break*
0945 – 1100	***Machine Translation with NLP*** *How Neural Machine Translation Works • Implementing Seq2Seq Models for Translation • Training a Custom Translation Model • Applications of NLP in Multilingual AI*
1100 – 1215	***Chatbot Development with NLP*** *Introduction to Chatbot Architecture • Training Chatbots Using Intent Classification • Implementing Dialogue Management with NLP • Deploying Chatbots in Real-World Applications*
1215 – 1230	*Break*
1245 – 1335	***Fake News Detection & Text Moderation*** *Understanding NLP-Based Text Moderation • Training AI to Detect Fake News • Implementing Toxicity Detection Using NLP • Applications in Social Media Content Filtering*
1335 - 1420	***Hands-On: Implementing NLP Applications*** *Training a Summarization Model Using Transformers • Fine-Tuning BERT for Question Answering • Implementing a Chatbot Using Deep Learning • Deploying NLP Applications in Real-Time*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Deploying NLP Models in Production*** *Exporting Models Using TensorFlow Lite • Deploying NLP Models as APIs Using Flask • Using Cloud Platforms for NLP Deployment • Monitoring NLP Models in Production*
0830 – 0930	***NLP in Edge Computing & Mobile AI*** *Running NLP Models on Mobile Devices • Optimizing NLP Models for Edge AI • Using TensorFlow Lite for On-Device NLP • Real-World Applications of NLP in Mobile AI*
0930 – 0945	*Break*
0945 – 1100	***Ethical Considerations in NLP*** *Addressing Bias in NLP Models • Privacy Concerns in AI-Driven Text Processing • Fairness & Transparency in AI-Generated Text • Case Studies on Ethical Failures in NLP*
1100 – 1215	***Future Trends in NLP & AI*** *Next-Generation Transformer Models • AI-Generated Text in Journalism & Automation • Real-Time AI for Conversational NLP • The Future of Multimodal NLP*
1215 – 1230	*Break*
1230 – 1345	***Capstone Project: End-to-End NLP Model*** *Selecting an NLP Use Case (Chatbot, Summarization, QA) • Training & Fine-Tuning NLP Models • Evaluating Model Performance • Deploying the Model for Real-World Use*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This hands-on, highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org