COURSE OVERVIEW IT0031
Sentiment Analysis using Python

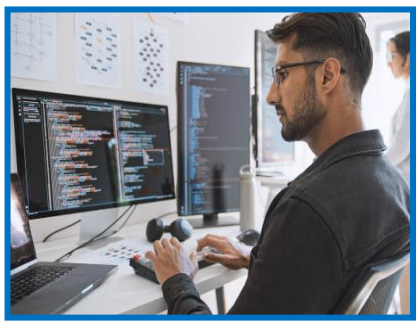
Course Title
Sentiment Analysis using Python

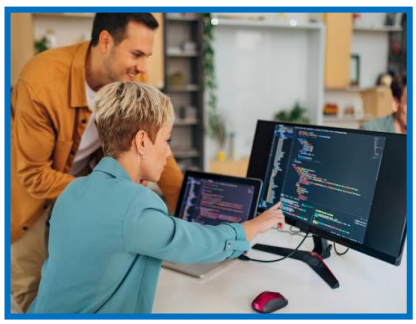
Course Date/Venue
Session 1: July 28 - August 01, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: September 28 - October 02, 2025/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai UAE

Course Reference
IT0031

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

Course Objectives





This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Sentiment Analysis using Python. It covers the sentiment analysis including its applications, challenges and analysis techniques; the natural language processing (NLP), python environment and text preprocessing for sentiment analysis; the text data structures, word frequency and n-gram analysis, word cloud visualization and sentiment trends in text; the sentiment lexicons, TextBlob for sentiment scoring, rule-based classification using NLP libraries and pros and cons of rule-based methods; and the conversion of text to numerical representation, bag-of-words (BoW) model, term frequency-inverse document frequency (TF-IDF) and word embeddings.

Further, the course will also discuss the labeled datasets, data into training and testing sets; the building of a sentiment classification model and evaluating model accuracy; the sentiment classification with naïve bayes, sentiment analysis using support vector machines (SVM) and deep learning for sentiment analysis; and the word embeddings for deep learning models and sentiment analysis using recurrent neural networks (RNN).

During this interactive course, participants will learn the long short-term memory networks (LSTM) for sentiment classification and bidirectional LSTM (BiLSTM) for text classification; the applications of transformers in real-world sentiment analysis and the bidirectional encoder representations from transformers (BERT); the sentiment analysis using GPT-3 and ChatGPT and transfering learning and multiple languages using AI; the customer feedback for sentiment trends, AI-driven sentiment monitoring in social media, product reviews, brand reputation and crisis detection from sentiment trends; the sentiment analysis in finance and stock market predictions and sentiment analysis models in production; the implementation of bias and fairness in sentiment analysis models; handling sarcasm and negations in sentiment detection and the responsible AI use in sentiment analysis; the advances in AI-driven sentiment analysis, real-time sentiment tracking using AI and sentiment analysis with multimodal AI; and the impact of generative AI on sentiment detection.

Course Objectives

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

- Apply and gain a good working knowledge on sentiment analysis using python
- Discuss sentiment analysis including its applications, challenges and analysis techniques
- Explain natural language processing (NLP), set the python environment and apply text preprocessing for sentiment analysis
- Illustrate text data structures, word frequency and n-gram analysis, word cloud visualization and identifying sentiment trends in text
- Identify sentiment lexicons, use TextBlob for sentiment scoring and apply rule-based classification using NLP libraries and pros and cons of rule-based methods
- Convert text to numerical representation and discuss bag-of-words (BoW) model, term frequency-inverse document frequency (TF-IDF) and word embeddings
- Prepare labeled datasets, split data into training and testing sets, build a sentiment classification model using logistic regression and evaluate model accuracy
- Implement sentiment classification with naïve bayes, sentiment analysis using support vector machines (SVM) and deep learning for sentiment analysis
- Illustrate word embeddings for deep learning models and sentiment analysis using recurrent neural networks (RNN)
- Implement long short-term memory networks (LSTM) for sentiment classification and implement bidirectional LSTM (BiLSTM) for text classification
- Discuss the applications of transformers in real-world sentiment analysis and implement bidirectional encoder representations from transformers (BERT)
- Apply sentiment analysis using GPT-3 and ChatGPT, transfer learning and multiple languages using AI
- Analyze customer feedback for sentiment trends and apply AI-driven sentiment monitoring in social media, product reviews and brand reputation and crisis detection from sentiment trends

- Carryout sentiment analysis in finance and stock market predictions and deploy sentiment analysis models in production
- Implement bias and fairness in sentiment analysis models, handle sarcasm and negations in sentiment detection and ensure responsible AI use in sentiment analysis
- Discuss the advances in AI-driven sentiment analysis, real-time sentiment tracking using AI, sentiment analysis with multimodal AI and the impact of generative AI on sentiment detection

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 sentiment analysis using python for data scientists and analysts, machine learning and AI enthusiasts, NLP practitioners and researchers, software developers and engineers, marketing and social media analysts, finance and stock market professionals, students and academics and other technical staff.

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 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.

Accommodation

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

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.

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. George Chel, PhD, MSc, BSc, Prince2, CISCO-CCNA, CISCO-CCENT, is a **Senior Communication & Telecommunications Engineer** with over **20 years** of extensive experience within the **Petrochemical**, **Oil & Gas** and **Power** industries specializing in **Fiber Optics** Technology, **Access Network** Planning, **Fiber Optics Transmission**, **Fiber Optic Cables** Construction, **Optical Drivers & Detectors**, **Fiber Optic** Termination, **Fiber Optic Cables** Installation, **Fiber Optics** System Design, **Media Converters**, **Fiber Optic** Systems Testing, **Optical Fibers** Technologies, **Opto-Electronics**, **Data Networking**, **Access Networks**, **Optical Networks**, DWDM, DSL, FTTH, GPON, **Wireless & Mobile Networks**, **Telecom** Technologies, **Core Network** Technologies, Broadband Architectures & Services, **Analogue & Digital Communications**, **IP Networking**, **Network Automation**, Software Defined Networking (**SDN**), Network Function Virtualization (**NFV**), Internet of Things (**IoT**), Converged Connectivity & Hybrid Access, RF Electronics & Digital Communications, **Communications Systems** Analysis, **Network Security**, **Computer Networks** Modelling & Simulation, **Data Networks & Communications**, **Networking Technology**, Networking Concepts, I**CT Systems** Management & Strategy, Strategic Information Systems, Wireless Access Points, Analogue & Digital Electronics, **Circuit Analysis**, **Circuit Design**, Electromagnetics, WiMAX Broadband Wireless System, Networking Design & Configurations, Practical **Industrial Data Communications & Telecommunications**, **Industrial Data Communication** Systems, Effective **Telecoms Strategies**, Integrated Electro-Optic Devices & Systems, **Telecom**, **Datacom & Network**, **EtherNet** Maintenance and Troubleshooting, Synchronous Digital Hierarchy (**SDH**), IP Telephony Design (**IPTD**) and LTE Technology (**WiMax**) Skills. He is currently the **Core Technologies Section Manager** of Hellenic Telecommunications Organization wherein he is responsible for managing, carrying, conducting, leading and participating in projects relating to the design, evaluation and trial of new aggregation/core network services & systems projects.

During his career, Dr. Chel has gained his practical and field experience through his various significant positions and dedication as the **Deputy Manager**, **Project Manager**, **Lab Section Head**, **Deputy Section Head**, **Program Leader**, **Access Technologies Senior Expert**, **Access Network Development Engineer**, **Telecom Engineer**, **Technical Engineer**, **Senior Expert**, **Senior Technical Instructor/Lecturer**, **Part-Time Lecturer**, **Development Engineer**, **R&D Engineer** and **Research Programmes Engineer**, **Post-Doctoral Research Associate** and **Teaching & Laboratory Assistant** from the Hellenic Telecommunication Organization – Deutsche Telekom Group, Fixed Access Shared Service Center – Deutsche Telekom Technology, OTE Academy, Athens Metropolitan College and Imperial College London.

Dr. Chel has a **PhD** in **Photonics**, **Optical Communications & Opto-Electronics** from the **Imperial College London**, **UK**, a **Master** degree in **Medical Physics & Clinical Engineering** from the **University of Sheffield**, **UK**, a **Bachelor** degree in **Physics** from the **University of Crete**, **Greece** and a **Graduate Diploma** in **Management** from the **University of London**, **UK**. Further, he is a **Certified Instructor/Trainer**, a **Registered PRINCE2 Project Management Practitioner**, a **Cisco Certified Network Associate Routing** and **Switching** (**CCNA**) and a **Cisco Certified Entry Networking Technician** (**CCENT**). Moreover, he is an author of many books, technical publication at high-profile scientific journals and conferences and deliver numerous trainings, courses, workshops, seminars and conferences internationally.

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	***Overview of Sentiment Analysis*** *What is Sentiment Analysis? • Applications of Sentiment Analysis • Challenges in Sentiment Analysis • Sentiment Analysis Techniques (Rule-Based, Machine Learning, Deep Learning)*
0930 – 0945	*Break*
0945 – 1040	***Introduction to Natural Language Processing (NLP)*** *Basics of NLP and Text Processing • Tokenization, Stemming and Lemmatization • Stopwords Removal and Noise Reduction • Importance of Context in NLP*
1040 – 1135	***Setting Up the Python Environment*** *Installing Python and Jupyter Notebook • Setting Up NLP Libraries (NLTK, SpaCy, TextBlob) • Installing Machine Learning Libraries (Scikit-Learn, Pandas, NumPy) • Introduction to Google Colab for Cloud-Based Analysis*
1135 - 1230	***Text Preprocessing for Sentiment Analysis*** *Removing Punctuation, Special Characters and Stopwords • Handling Contractions and Spelling Corrections • Text Normalization Techniques • Lemmatization versus Stemming*
1230 – 1245	*Break*
1245 – 1335	***Exploratory Data Analysis (EDA) on Text Data*** *Understanding Text Data Structures • Word Frequency and N-Gram Analysis • Word Cloud Visualization • Identifying Sentiment Trends in Text*
1335 - 1420	***Hands-On: Preprocessing & Cleaning Text Data*** *Tokenizing and Cleaning Sample Datasets • Removing Noise and Preparing Data for Analysis • Applying NLP Techniques for Feature Extraction • Visualizing Cleaned Text Data*
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	***Rule-Based Sentiment Analysis*** *Understanding Sentiment Lexicons (VADER, SentiWordNet) • Using TextBlob for Sentiment Scoring • Rule-Based Classification Using NLP Libraries • Pros and Cons of Rule-Based Methods*
0830 – 0900	***Feature Engineering for Machine Learning*** *Converting Text to Numerical Representation • Bag-of-Words (BoW) Model • Term Frequency-Inverse Document Frequency (TF-IDF) • Word Embeddings (Word2Vec, GloVe)*
0900 – 0915	*Break*

0915 – 1100	***Sentiment Analysis Using Scikit-Learn*** *Preparing Labeled Datasets • Splitting Data into Training and Testing Sets • Building a Sentiment Classification Model Using Logistic Regression • Evaluating Model Accuracy*
1100 – 1230	***Implementing Sentiment Classification with Naïve Bayes*** *Understanding Probabilistic Classification • Implementing Multinomial Naïve Bayes for Text Classification • Evaluating Precision, Recall and F1-Score • Optimizing Hyperparameters for Better Performance*
1230 – 1245	*Break*
1245 – 1335	***Sentiment Analysis Using Support Vector Machines (SVM)*** *Introduction to SVM for Text Classification • Training an SVM Model for Sentiment Analysis • Hyperparameter Tuning in SVM • Comparing SVM with Naïve Bayes*
1335 - 1420	***Hands-On: Building a Sentiment Analysis Model*** *Implementing Sentiment Analysis Using Rule-Based and ML Approaches • Training a Sentiment Classifier on Real-World Datasets • Hyperparameter Tuning for Improved Performance • Evaluating Model Effectiveness with Classification Metrics*
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 Sentiment Analysis*** *Difference Between Machine Learning and Deep Learning • Understanding Artificial Neural Networks (ANN) • Role of Deep Learning in NLP • Popular Deep Learning Frameworks (TensorFlow, Keras, PyTorch)*
0830 – 0900	***Word Embeddings for Deep Learning Models*** *Introduction to Word2Vec and GloVe • Creating Word Embeddings Using Pre-Trained Models • Using Embeddings for Sentiment Classification • Visualizing Word Vectors Using t-SNE*
0900 – 0915	*Break*
0915 – 1100	***Sentiment Analysis Using Recurrent Neural Networks (RNN)*** *Understanding Sequential Data Processing • Implementing RNN for Text Classification • Training an RNN Model for Sentiment Analysis • Challenges of RNN in NLP*
1100 – 1230	***Long Short-Term Memory Networks (LSTM) for Sentiment Analysis*** *Understanding LSTM Architecture • Implementing LSTM for Sentiment Classification • Training on IMDB Movie Review Dataset • Optimizing LSTM Performance*
1230 – 1245	*Break*
1245 – 1335	***Sentiment Analysis Using Bidirectional LSTM (BiLSTM)*** *Advantages of BiLSTM Over Standard LSTM • Implementing BiLSTM for Text Classification • Improving Sentiment Detection Using BiLSTM • Fine-Tuning BiLSTM Models*

1335 - 1420	***Hands-On: Deep Learning-Based Sentiment Analysis*** *Implementing Word Embeddings for Sentiment Analysis • Training LSTM and BiLSTM Models on Sentiment Datasets • Evaluating Deep Learning Models Using Accuracy and Loss Metrics • Hyperparameter Tuning in Deep Learning Models*
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

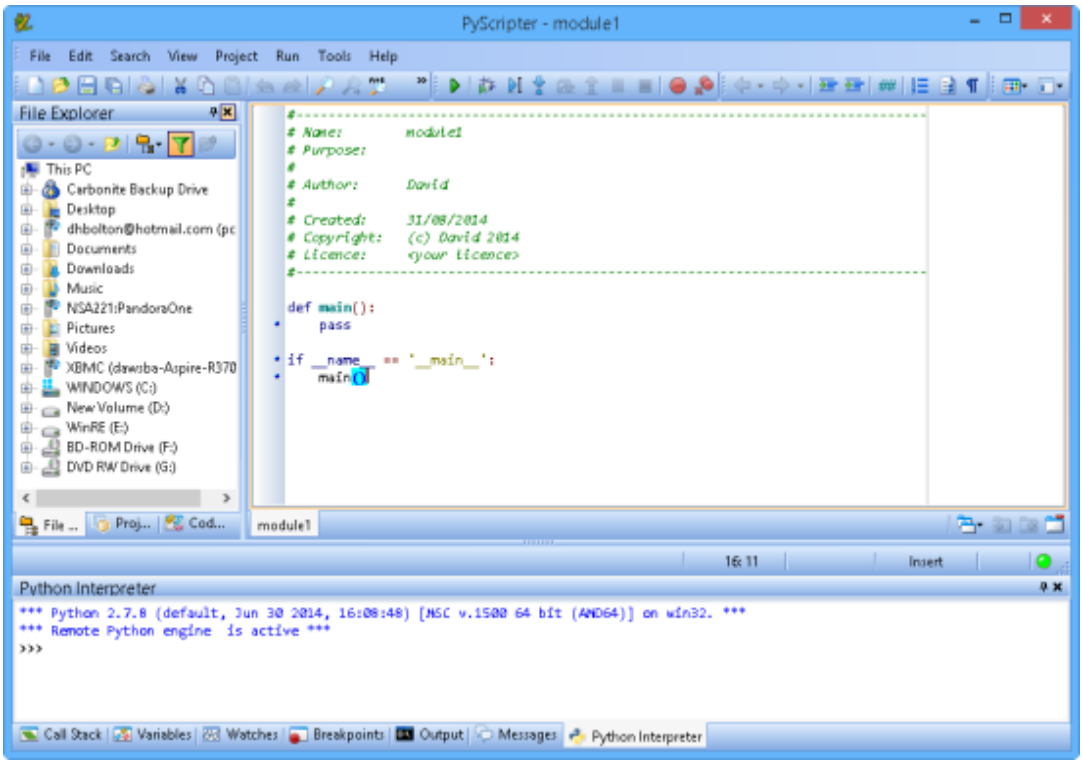
0730 – 0830	***Transformers for Sentiment Analysis*** *Evolution of Transformer-Based Models in NLP • Differences Between Traditional ML and Transformer-Based Models • BERT versus GPT for Sentiment Analysis • Applications of Transformers in Real-World Sentiment Analysis*
0830 – 0930	***Implementing Sentiment Analysis Using BERT*** *Overview of BERT (Bidirectional Encoder Representations from Transformers) • Pre-Trained BERT Models for Sentiment Classification • Fine-Tuning BERT for Sentiment Analysis • Performance Evaluation of BERT-Based Models*
0930 – 0945	*Break*
0945 – 1100	***Sentiment Analysis Using GPT-3 & ChatGPT*** *Understanding GPT Models for Text Analysis • Using OpenAI's GPT-3 for Sentiment Classification • Pros and Cons of Generative Models for Sentiment Analysis • Comparing GPT-3 With Traditional ML and Deep Learning Approaches*
1100 – 1215	***Transfer Learning in Sentiment Analysis*** *What is Transfer Learning? • Fine-Tuning Pre-Trained Models for Sentiment Classification • Customizing Transformer Models for Industry Applications • Evaluating Transfer Learning Performance*
1215 – 1230	***Break***
1245 – 1335	***Sentiment Analysis in Multiple Languages Using AI*** *Challenges of Multilingual Sentiment Analysis • Implementing Sentiment Analysis in Different Languages • Using Pre-Trained Multilingual Models • Evaluating Cross-Language Sentiment Models*
1335 - 1420	***Hands-On: Transformer-Based Sentiment Analysis*** *Fine-Tuning BERT for Sentiment Classification • Implementing Sentiment Analysis Using GPT-3 • Evaluating Performance of Transformer-Based Models • Comparing Transformer-Based Models With ML/DL Approaches*
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	***Sentiment Analysis for Business & Social Media Monitoring*** *Analyzing Customer Feedback for Sentiment Trends • AI-Driven Sentiment Monitoring in Social Media • Sentiment Analysis in Product Reviews and Brand Reputation • AI-Powered Crisis Detection from Sentiment Trends*
0830 – 0930	***Sentiment Analysis in Finance & Stock Market Predictions*** *Sentiment Analysis for Financial News Articles • AI-Driven Stock Market Sentiment Classification • Using Sentiment Scores for Investment Strategies • Sentiment-Based Market Sentiment Indicators*
0930 – 0945	*Break*
0945 – 1100	***Deploying Sentiment Analysis Models in Production*** *Building REST APIs for Sentiment Analysis Using Flask • Deploying AI Models Using Cloud Platforms (AWS, Google Cloud) • Integrating Sentiment Analysis Models with Web Applications • Monitoring and Maintaining AI Models in Production*
1100 – 1215	***Ethical Considerations & Challenges in Sentiment Analysis*** *Bias and Fairness in Sentiment Analysis Models • Handling Sarcasm and Negations in Sentiment Detection • Privacy Concerns in Text Analysis • Ensuring Responsible AI Use in Sentiment Analysis*
1215 – 1230	*Break*
1230 – 1300	***Future Trends in Sentiment Analysis*** *Advances in AI-Driven Sentiment Analysis • Real-Time Sentiment Tracking Using AI • Sentiment Analysis with Multimodal AI (Text, Voice and Video) • The Impact of Generative AI on Sentiment Detection*
1300 - 1345	***Hands-On: End-to-End Sentiment Analysis Project*** *Implementing Sentiment Analysis in a Real-World Dataset • Deploying an AI-Powered Sentiment Analysis Web App • Evaluating Model Performance with Real User Inputs • Showcasing Final Sentiment Analysis Project*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Hands-on practical sessions will be arranged for all participants throughout the course duration using “PyScripter with Python” simulator.



PyScripter with Python

Course Coordinator

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