



Introduction to Artificial Intelligence

Welcome to the " Artificial Intelligence" course at St. Bede's College. This 3rd-year undergraduate course offers a comprehensive blend of theory, practical application, and project-based learning. Over 45 lectures, students will gain hands-on experience with essential AI tools like Python, Google Colab, and Teachable Machine, preparing them for the rapidly evolving field of AI.



Course Overview & Foundational Concepts

Course Details

- Level: 3rd Year Undergraduate
- Duration: 45 Lectures
- Type: Theory + Practical + Project
- Tools: Python, Google Colab, Teachable Machine

Unit 1: Introduction to AI

This unit covers the history and evolution of AI, differentiating it from Machine Learning and Deep Learning. We'll explore real-world applications in healthcare, banking, education, and daily life, alongside discussions on AI ethics and limitations.

Practical: Students will train an image model using Google Teachable Machine and experiment with creative AI tools like ChatGPT or DALL·E.



Python Essentials for AI



Python Basics

A refresher on Python fundamentals, including variables, loops, and functions, tailored for AI applications.



Data Handling

Learn to use Numpy and Pandas for efficient data manipulation and processing.



Data Visualization

Master Matplotlib and Seaborn for creating insightful data visualizations.



Development Environments

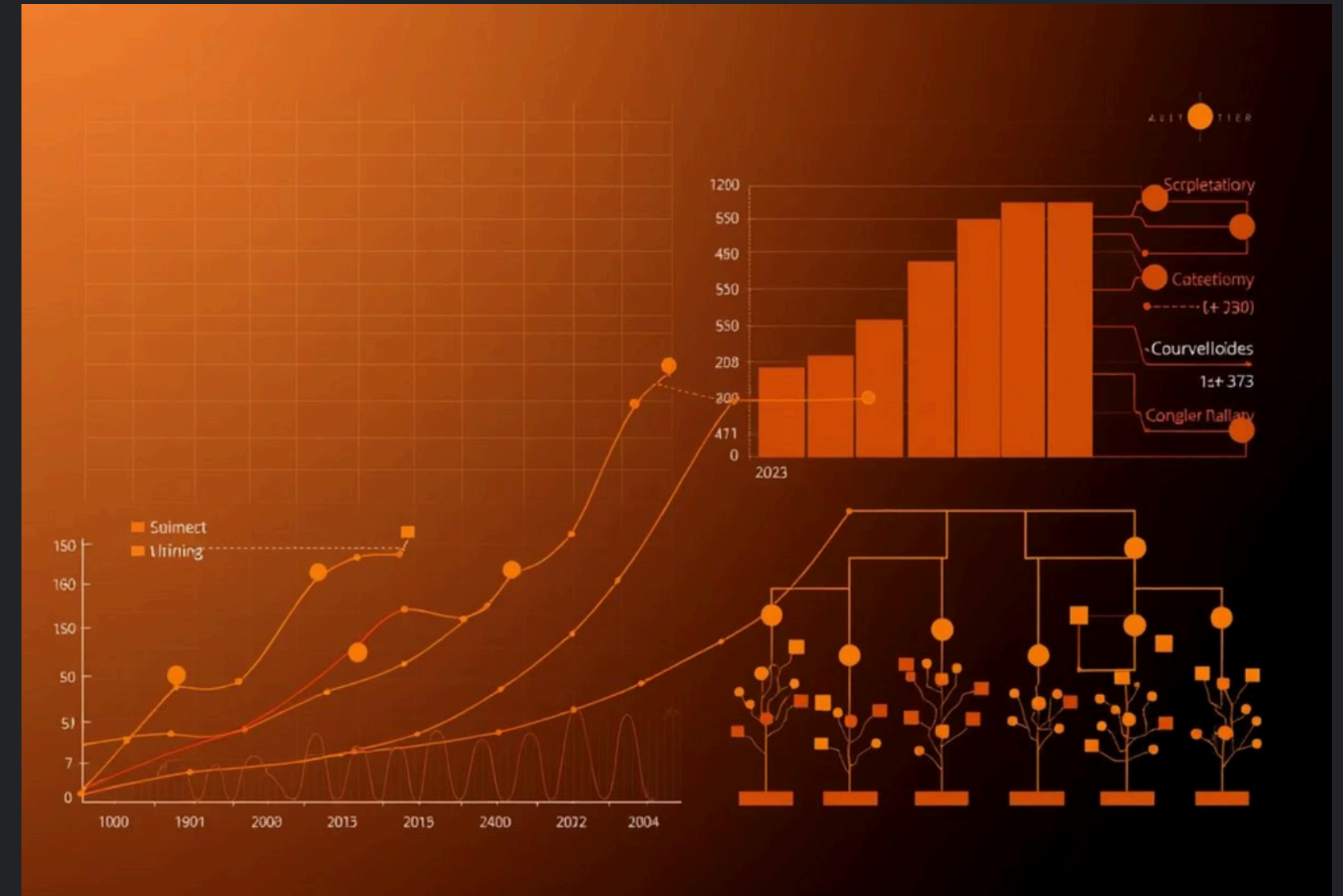
Introduction to Jupyter Notebook and Google Colab for interactive coding.

Practical: Students will load, visualize, and clean datasets using Pandas, and create simple charts with Matplotlib, building a strong foundation for practical AI tasks.

Machine Learning Fundamentals

Unit 3: Machine Learning Basics

- Introduction to Machine Learning
- Types: Supervised, Unsupervised, Reinforcement Learning
- Core Algorithms: Linear Regression, Decision Trees
- Understanding Classification vs. Regression problems



Practical: Students will use scikit-learn to build a simple regression model. They will also apply a Decision Tree algorithm to classify flowers using the famous Iris dataset, gaining hands-on experience with fundamental ML techniques.

Hands-on AI Mini Projects

1

Student Grade Prediction

Develop a model to predict student grades based on attendance data.

2

Spam Email Classifier

Build a system to distinguish between spam and legitimate emails.

3

Housing Price Prediction

Create a model to forecast housing prices based on various features.

4

Face Detection

Implement face detection using the OpenCV library.

5

Basic AI Chatbot

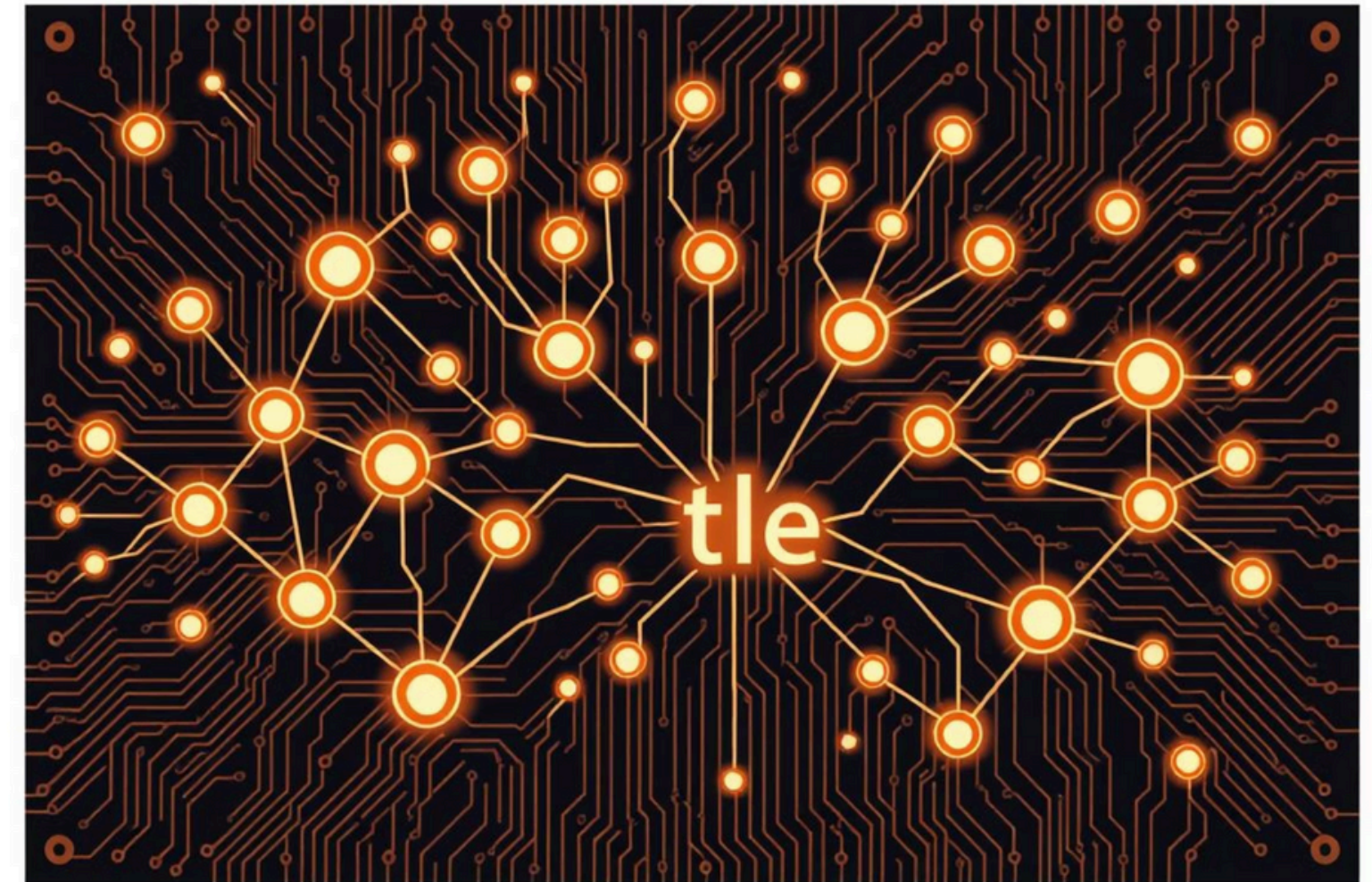
Develop a simple AI chatbot utilizing Natural Language Processing (NLP) concepts.

Practical: Students will implement a full mini-project in Google Colab, including model training, testing, and evaluation, presenting their outputs through charts or text.

Neural Networks & Natural Language Processing

Unit 5: Neural Networks & NLP

- Introduction to Neural Networks: layers, neurons, weights
- Building a Simple ANN using Keras
- NLP Basics: Tokenization, Stopwords, Sentiment Analysis
- Introduction to Chatbots



Practical: Students will build a simple neural network with Keras and perform sentiment analysis on real-world data like tweets or reviews, applying core concepts of deep learning and NLP.

Capstone: Final AI Projects

In the final unit, students will apply all acquired knowledge to a comprehensive final project, choosing from a variety of impactful AI applications. This hands-on experience solidifies their understanding and prepares them for real-world scenarios.

Sentiment Analysis System

Image Classification Model

Resume Screening Bot

Fake News Detector

Student Performance Predictor



Learning Outcomes & Future Prospects

Upon completion of this course, students will possess a robust understanding of AI and Machine Learning fundamentals, complemented by extensive hands-on Python practice. They will be adept at utilizing real-world datasets for analysis and prediction, and capable of building and deploying mini AI models using free, accessible tools.

This comprehensive training prepares students for entry-level roles or certifications in the dynamic fields of AI and Machine Learning, equipping them with practical skills and theoretical knowledge for future success.