TFC

ULTIMATE GUIDE TO THE

TensorFlow Developer Certificate

Welcome to the TensorFlow Developer Certificate Course.

Google's TensorFlow Developer Certificate exam tests a developer's foundational knowledge of integrating machine learning into tools and applications. It certifies your understanding of building TensorFlow models using Computer Vision, Convolutional Neural Networks, Natural Language Processing, and real-world image data and strategies.

This course provides you with the exact set of skills you need to obtain Google's official TensorFlow Developer Certificate and prove your expertise in ML and AI in a rapidly growing global job market. Gain practical machine learning skills for the real world, and position yourself to demonstrate your expertise to future employers.

Get ready to pass the exam, certify your skills worldwide, advance your career and earn more with TensorFlow in your toolkit.

This course is targeted towards AI practitioners, aspiring data scientists, tech enthusiasts, and consultants wanting to pass the TensorFlow Developer Certification, including:
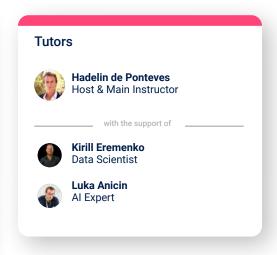
— Data Scientists who want to learn how to use TensorFlow at an advanced level

— Data Scientists who want to pass the TensorFlow Developer Certification

— AI Practitioners who want to build more powerful AI models using TensorFlow

— Tech enthusiasts who are passionate about AI and want to gain real-world practical experience with TensorFlow

Highlights

+ 144 Tutorials
+ 17 Hours of Video Content
+ 10 Practical Case Studies
+ Regularly Updated Sample Exam Questions
+ Lifetime Access
+ Hands-On with A Certified Instructor
+ Start from Scratch
+ Pass or We Pay Guarantee*
  (see page 14 for details)

Tutors

Hadelin de Ponteves
Host & Main Instructor

——————— with the support of ———————

Kirill Eremenko
Data Scientist

Luka Anicin
AI Expert

Prerequisites

• No special prerequisites are needed
• Open to anyone with basic programming knowledge
• Some experience in Machine Learning is preferable but not essential

! Ensure you have a G-mail account to access all the required course materials.

GET STARTED

PART 1 to 3: Deep Learning

Start by studying Deep Learning in-depth to develop your understanding of different types of neural networks and how they work. While covering Deep Learning theory, we will build three neural networks, including an Artificial Neural Network, a Convolutional Neural Network and a Recurrent Neural Network. All work will be done from scratch, step-by-step, and coded every single line of together.

Chapter Action

You will receive three separate notebooks, in which we will build an Artificial Neural Network, Recurrent Neural Network and Convolutional Neural Network. To solidify your knowledge of Deep Learning basics, we will code every single line together from scratch. Later on, you will be given more independence with notebooks to progress in this course more efficiently.

Parts In More Detail

PART 1: ARTIFICIAL NEURAL NETWORKS

- Learn about the Human Neuron and how it functions
- Learn how the Activation Function is defined and how it is used to shift to an Artificial Neuron
- Learn how Neural Networks work and learn and explore Stochastic Gradient Descent
- Study the fundamental process of Back-Propagation through which Stochastic Gradient Descent is applied to update the weights in neural networks
- Build an ANN with TensorFlow in five steps from scratch

PART 2: RECURRENT NEURAL NETWORKS

- Gain an introduction to Convolutional Neural Networks, and understand the steps behind their functioning, starting with:
  - Step 1: The Convolution operation
  - Step 2: Pooling
  - Step 3: Flattening
  - Step 4: Full Connection

- Explore the Softmax Activation Function & Cross-Entropy Loss Function work with CNNs

- Build a CNN with TensorFlow in five steps from scratch

PART 3: CONVOLUTIONAL NEURAL NETWORKS

- Gain an understanding the idea behind Recurrent Neural Networks

- Explore the Vanishing Gradient Problem

- Learn about Long Short-Term Memory (LSTMs) and how they work. Dive deeper into studying LSTM variations

- Build an RNN with TensorFlow in 15 steps from scratch

PART 4 to 10: Computer Vision

Now that you have the basics covered, you will be prepared to dive deeper into the course materials independently. This section introduces you to Computer Vision and has you code the first Computer Vision Neural Network along with your instructor. We will also dive deeper into convolutions, understand how to handle more complex and real-world images, get a solid understanding of image augmentation, and explore the concept of transfer learning. You will also move from binary to multi-class classification.

Chapter Action

Now that you know how to code three different types of neural networks, you'll be able to start coding more independently going forward. Instead you will review the notebooks with your instructor, review their essential parts, and dive deeper into them yourself. You will do so thanks to highly-detailed written explanations that include text next to each cell. This section includes 10 notebooks.

Parts In More Detail

PART 4: INTRO TO COMPUTER VISION

- Introduction to Computer Vision

- Learn how to load training data for a Computer Vision task

- Code your first Computer Vision Neural Network

- Learn how to use callbacks to control the training

PART 5: MASTERING CONVOLUTIONS

- Dive deeper into convolutions

- Work on a Fashion classifier with more advanced convolutions that improve the results

- Work on a new dataset with the same advanced convolutions that improve the results

- Learn how to perform further improvements through cropping

PART 6: RECURRENT NEURAL NETWORKS

- Learn how the ImageGenerator works to handle more complex images

- Learn how to define a ConvNet to use on complex images

- Learn how to train the ConvNet with fit_generator

PART 7: MORE REAL-WORLD IMAGES

- Build and train the ConvNet for real-world images

- Learn how to add automatic validation to test and improve the accuracy

- Explore the impact of compressing images

PART 8: IMAGE AUGMENTATION

- Dive deeper into image augmentation

- Code the augmentation technique with ImageDataGenerator

- Code the technique on cats vs. dogs and horses vs. humans datasets

PART 9: TRANSFER LEARNING

- Understand the concept of transfer learning

- Code transfer learning from the inception mode

- Explore how to use dropouts to reduce overfitting

- Code your our own model by using transferred features

PART 10: MULTI-CLASS CLASSIFICATION

- Move from binary to multi-class classification

- Explore multi-class classification with the Rock Paper Scissors dataset

- Train a classifier with the Rock Paper Scissors dataset and test that same classifier

PART 11 to 13: JavaScript

In this section, you will learn and explore the diverse skills and tools needed to become a complete master in TensorFlow. You will be introduced to Computer Vision and Transfer Learning, this time in JavaScript. You will learn how to reuse and convert existing models to JavaScript, and dive deep into the performance of new models.

Chapter Action

This chapter on JavaScript will not be covered on the exam, so feel free to skip these sections if you are just here to train for the TensorFlow Developer Certificate exam. However, it's always a plus to understand TensorFlow's diverse tools so if you really want to master TensorFlow and explore all the tools within it, follow along further. Here, we will review one notebook together and you will dive deeper into it yourself having the assistance of highly-detailed written explanations.

Parts In More Detail

PART 11: COMPUTER VISION IN JAVASCRIPT

- Create a Convolutional Net with JavaScript

- Visualize the training process

- Learn how to use the Sprite Sheet, and then tf.tidy() to Save Memory

PART 12: REUSING EXISTING MODELS IN JAVASCRIPT

- Learn how to use Pre-trained TensorFlow.js models

- Understand the Toxicity Classifier

- Be introduced to MobileNet using TensorFlow.js, and explore a MobileNet example

- Learn how to convert models to JavaScript

PART 13: TRANSFER LEARNING IN JAVASCRIPT

- Learn how to retrain the MobileNet Model using Transfer Learning

- Learn how to capture the data to re-train the network

- Learn how to perform inference

PART 14 to 17: Natural Language Processing

In this section, you will receive an in-depth introduction to Natural Language Processing and explore tokenization and sequences in detail. Explore embeddings and recurrent models, and understand how LSTMs are applied to NLP and then implement several LSTMs together. While learning the foundations of NLP, you will also dive into text generation with RNNs and train RNNs by using inference.

Chapter Action

Now that we're back into TensorFlow Developer Certificate exam material, make sure not to skip these upcoming sections. Prepare to review a total of 14 notebooks together and dive deeper into them yourself with highly-detailed written explanations.

Parts In More Detail

PART 14: INTRODUCTION TO NLP - TOKENIZATION AND SEQUENCES

- Learn the basic principles behind Natural Language Processing

- Understand how word-based encodings work

- Learn how to go from text to sequence using the tokenizer

- Explore how padding works during the process of preprocessing texts

PART 15: INTRODUCTION TO NLP - EMBEDDINGS

- Learn the basic principles of embeddings
- Work with the IMDB dataset to look into the details of embeddings
- Build a classifier for a sarcasm-based dataset

PART 16: INTRODUCTION TO NLP - EXPLORING RECURRENT MODELS

- Learn the basic principles of recurrent models used for NLP
- Learn how LSTMs are applied to NLP and implement several LSTMs for NLP
- Learn how to use a convolutional neural network to perform NLP tasks

PART 17: CREATE TEXT WITH RNNS

- Learn the basic principles behind text generation with RNNs
- Learn how to train RNNs on text data to discover what the next word should be in a sequence
- Attempt to create poetry by using RNNs

PART 18 to 21: Time Series Analysis

This section focuses on theory and all the code will be presented on the slides. You will be introduced to Time Series analysis and learn the specifics of sequences and prediction. We will dive deep into examples, common patterns and metrics for evaluating the performance of Time Series, cover the concepts of moving average and differencing, as well as understand how forecasting works. Learn how Machine Learning is applied to Time Series and make predictions. Finally, gain a conceptual overview of how RNNs are used with sequences and how to use convolutions for real-world Time Series.

Chapter Action

This chapter is purely theory and you won't find notebooks or practical projects. All coding for the following sections will be presented on the slides and explained in detail.

Parts In More Detail

PART 18: SEQUENCES AND PREDICTION

- Learn the basic principles behind Time Series and review examples and common patterns

- Learn how to split your Time Series into the train, validation and test sets

- Study the different metrics for evaluating the performance of Time Series

- Cover the concepts of moving average and differencing

- Learn what differs between trailing windows and centered windows

- Learn how forecasting works in Time Series

PART 19: PREDICTING SEQUENCES WITH MACHINE LEARNING

- Learn how Machine Learning is applied to Time Series; preparing the features and labels

- Learn how to feed a windowed dataset into a Neural Network, which will be a single layer Neural Network

- Apply Machine Learning on time windows and perform prediction

- Perform more advanced tasks by training a Deep Neural Network, tuning it, and making predictions

PART 20: USING RNNS WITH SEQUENCES

- Gain a conceptual overview of how RNNs are used with sequences

- Learn how to determine the shape of the inputs to the RNN

- Learn how to output a sequence and how lambda layers can improve performance

- Learn how to make further performance improvements, and see how to adjust the learning rate dynamically

- Learn how to use the LSTM with the same sequences

PART 21: REAL-WORLD TIME SERIES

- Learn how to use convolutions for real-world Time Series

- Master Bi-directional LSTMs for real-world time series

- Analyze a real dataset about sunspots, and train and tune the model and make predictions.

PART 22 to 25: TensorFlow Lite

In this bonus section, you will be introduced to TensorFlow Lite and to its different features and components, including its architecture and performance. Then we will cover some optimization techniques in TensorFlow Lite and see the very important concept of quantization. Further, we will learn how to convert a model to TensorFlow Lite and understand how to do Transfer Learning with TensorFlow Lite. We will also dig deeper and learn how to implement TensorFlow Lite in Android and iOS, as well embedded systems like Raspberry Pi.

Chapter Action

This chapter on TensorFlow Lite is not part of the exam, so feel free to skip the parts if you are just here to train for the TensorFlow Developer Certificate exam. However it's always a plus to know the diverse tools of TensorFlow so if you really want to be a global master in TensorFlow and explore all the tools around it, then join us in this part to learn more. No notebooks in the presented parts, just enjoy getting this extra knowledge in TensorFlow by following the lectures.

Parts In More Detail

PART 22: INTRODUCTION TO TF LITE

- Learn the basic principles behind TensorFlow Lite, its different features and components, including its architecture and performance

- Cover optimization techniques in TensorFlow Lite

- Explore the important concept of quantization

- Understand how to save, convert, and optimize a model

- Learn how forecasting works in Time Series

- Learn about TF-Select and how to convert a model to TFLite

- Learn how to do Transfer Learning with TFLite

PART 23: TF LITE AND ANDROID

- Learn the basic principles behind TF Lite with Android

- Explore the architecture of a model in Android

- Learn how to initialize the Interpreter and prepare the Input

- Learn how to perform inference and get results

PART 24: TF LITE AND IOS

- Learn the basic principles behind TF Lite with iOS

- Learn about Swift and how it is used with TensorFlowLite

- Gain an introduction to TenserFlowLiteSwift

- Learn how to initialize the interpreter, prepare the inputs, do inference and get the results

PART 25: TF LITE AND MICRO SYSTEMS

- Review TF Lite with Micro Systems. You will be shown how to start working on a Raspberry Pi, illustrate this with Image classification and then follow the same 4 step process as before:
  - initializing the interpreter
  - preparing the inputs
  - doing inference
  - and finally getting the results

EXAM 1 - 3: REAL TENSORFLOW CERTIFICATION EXAM SOLUTIONS AND EXPLANATIONS

In this section, you will be presented with a detailed overview of the real TensorFlow Developer Certificate exams to prepare you to pass the certification assessment. Our detailed explanations will help you understand exam expectations, and demonstrate the required practical Machine Learning skills through the building and training of models using TensorFlow. The content of this section will be updated in line with the formation of new assessment exam questions developed by the TensorFlow team.

Learn From An Industry Leader

Most Popular Artificial Intelligence Course Online

1.200.000+ Students In All Courses

200.000+ 5 Star Reviews

Hadelin de Ponteves

Hadelin is an ex-Google Artificial Intelligence expert holding an Engineering Masters degree from École Centrale Paris with a specialization in Machine Learning.

He is a Co-Founder and CEO at BlueLife AI, which leverages the power of Artificial Intelligence to empower businesses to make massive profits by innovating, automating processes and maximizing efficiency. He is an online entrepreneur who has created over 70 top-rated educational e-courses, which have made 2M+ sales in 210 countries.

Hadelin's personal philosophy is to help people around the world leverage the available cutting-edge knowledge to create a better world.

with the support of

Kirill Eremenko
Data Scientist

Luka Anicin
AI Expert

TFC

Included Services Provided With The Course

Pass Insurance

Worried about the financial costs associated with certification? Our Pass or We Pay Guarantee* is the reassurance you need to dive right into this course and sit the TensorFlow Developer Certificate exam with confidence.

If you sit your TensorFlow Developer Certificate exam within 30 days of enrolling, fully complete this course and receive a score above zero, but below the minimum score required to pass the exam, then we will pay for your second exam attempt provided the following conditions are met:

- you paid at least $1 for this course and it was not refunded, AND before sitting the exam, you diligently watched and followed along with all of the tutorials in the course (completed all case studies and have all codes under your Google Colab account);

- you completed all practical activities including but not limited to challenges within the sections, quizzes, homework exercises and all provided practice exams.

TFC Community

Want to get listed on Google's TensorFlow Certified Network? **Landing on Google's TensorFlow Certificate Network means you're part of only 1000 DL/ML professionals in the entire world who have their skills verified by the AI giant. Passing the exam means you'll gain the recognition you need to beat the crowd in a global AI job market, and attract employers by becoming listed on Google's public network of developers.**

If you want to become a member of the TensorFlow Certificate Global Network and boost your resume even further, you've come to the right place.

Technical Support

Follow along as AI Expert and TensorFlow-certified instructor Hadelin de Ponteves guides you step-by-step in building Deep Learning models in TensorFlow. And if you need help, don't hesitate to get in touch -- the TFC team of instructors and tutors are here to help. Do you have more questions for us? No problem! Our team is on standby to answer any concern or uncertainty you may have. Visit the TFC website or get in touch with us directly at support@tfcertification.com.