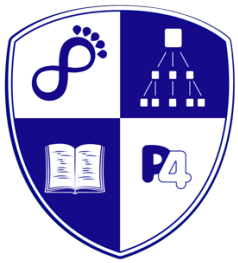

# BA-001
# Introduction to End-User Network Programmability

Course Prospectus

BA-001 is an intensive 1-day course, designed to introduce wide audiences of developers, system integrators, academics and network equipment end-users to the principles and benefits of devices with programmable data planes. The course focuses on the state-of-the-art approaches to programmability including P4 programming language for data plane programming, Barefoot Tofino™ ASIC and P4Studio Software Development Environment.

## Course Goals

Upon the completion of the course, the students will have gained the following skills:

1. Understanding of the network device architecture with the emphasis on the programmable data plane and control plane interfaces
2. Understanding of the basic data plane algorithms and development approaches
3. Basic understanding of P4_16 language, its main concepts and constructs
4. Basic understanding of the architecture of the Tofino™ programmable pipeline and its main resources
5. Basic understanding of the APIs for managing both P4 objects and fixerd-function components
6. Understanding of P4Studio SDE components and their roles in data and control plane development
7. Understanding of the role of the control plane (Networks Operating System) and its interaction with the data plane

The course can optionally include a basic demonstration lab, conducted in the virtual simulation environment.

## Target Audience

This course is most suitable for designers and architects, tasked with making strategic decisions in the areas of network, telecommunications equipment and control software design and architecture

## Pre-requisites

- General understanding of network and telecommunications architecture and protocols

## Sample Schedule

08:45AM – 09:15AM: Arrival, Registration and Breakfast
09:15AM – 09:30AM: Welcome
09:30AM – 11:00AM: Lecture 1
11:05AM – 11:15AM: Break
11:15AM – 12:45PM: Lecture 2
12:45PM – 01:45PM: Lunch
01:45PM – 03:15PM: Lecture 3
03:15PM – 03:30PM: Break
03:30PM – 05:00PM: Lecture 4
05:00PM – 06:30PM: Lab
06:30PM – 07:00PM: Conclusion

## Curriculum

The following topics will be covered during the course. Theoretical material will be reinforced through the lab..

- How the network devices are built
  - Standard Telecommunications Architecture
  - The anatomy of a modern switch
    - Hardware Architecture
    - Software Architecture
    - Business models
- How Programmable Switch ASICs are built
  - General Architecture and components
  - Why programmability is possible
  - Protocol-Independent Switching Architecture (PISA)
  - Understanding standard Match-Action implementations
- Introduction to P4 (by example) and Data Plane Algorithms
  - L2 Switching
  - L3 Switching
  - Tunneling
  - Mirroring and Telemetry
  - Control Plane packet Interface

    - Cool Things
- P4 Lab
- Conclusion

## Important Notes

BA-001 is an introductory course, designed to cover a variety of topics and provide guidance for the future exploration and development. For in-depth exploration of the selected topics, please ask about our BA-101 class or the upcoming "Level 2" classes and video training modules.

Barefoot P4Studio™ SDE is a software product, developed independently from the software, available via p4.org. Some components of the P4Studio were contributed by Barefoot to p4.org, but the goals of the projects, the main tools, and the workflows are different. p4.org software is a community-supported project with many resources freely available. This class covers Barefoot's P4Studio and not p4.org software.

## Logistics

Public classes are conducted at Barefoot Networks' training facility at 4750 Patrick Henry Drive, Santa Clara, CA, 95054 and in many international locations. Registration can be completed online ahead of time. Registration fee includes quality printed materials, breakfast, lunch and afternoon snack for all days.

All students are expected to bring a laptop for the labs.  No special software is required.

## Contact

For more information, please contact academy@barefootnetworks.com.