Agenda

1. Emerging Technologies and NetAcad
2. IoT Fundamentals Learning Pathways
3. Getting Ready for IoT Fundamentals
4. IoT Fundamentals Details
5. IoT Fundamentals Learning Tools
Emerging Technologies and the Networking Academy
Perfect Storm

Massive Youth Unemployment

74M
Unemployed Youth

Growing Skills Shortage

63%
of CEOs see lack of skills as a serious concern

Unprecedented Opportunity

$11.1T
Economic Value Add by 2025

Mckinsey Center for Government, Education to Employment

PWC, 17th Annual Global CEO Survey

Mckinsey Global Institute; IoT: Mapping the Value Beyond the Hype
Digital Transformation across Countries and Companies

IoT merges physical and virtual worlds, creating smart environments

- Smart City
- Smart Hospital
- Smart Highway
- Smart Factory
New Opportunities = Employment Paths for Students

Existing Networking Academies

1M Students
20K Instructors
9K Academies

New Academies and/or New Departments at Existing Academies

- Process Control Engineering
- Energy Management
- Industrial Automation
- Transportation Engineering
Why Cisco?

- Innovative Technology Solutions
- CSR Commitment
- Global Partnerships
- Trusted Leader
Cisco Conducts Research on the new Emerging Technologies Skillsets and How to Teach Them

We engage potential employers in developing and testing emerging curricula:
- Mentor students
- Program advisors
- Internship providers
- Hire students

Building Blocks to Create Digital Expertise

- Problem Analysis to Customer Solution
- Technical Skills & Rapid Prototyping
- Collaboration & Business Skills
- Multi-Disciplinary & Project Based
- Active Employer Engagement

Depth in Specialization

Multi-Disciplinary Breadth
Emerging Technologies Align with our Portfolio Strategy

Exploratory
Consider a career in technology

Foundational
Prepare for a technology career

Career-Ready
Step into your technology career

Collaborate for Impact
Contribute to a creative and innovative process
Synthesize skills to solve real-world problems

Exposure  Education  Experience
## The Networking Academy Learning Portfolio

### Current & Planned

<table>
<thead>
<tr>
<th>Category</th>
<th>Exploratory</th>
<th>Foundational</th>
<th>Career-Ready</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Networking</strong></td>
<td></td>
<td>Networking Essentials</td>
<td>CCNA R&amp;S: Introduction to Networks, R&amp;S Essentials, Scaling Networks, Connecting Networks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mobility Fundamentals</td>
<td>CCNP R&amp;S: Switch, Route, TShoot</td>
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<tr>
<td><strong>Security</strong></td>
<td>Introduction to Cybersecurity</td>
<td>Cybersecurity Essentials</td>
<td>CCNA Security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IoT Security*</td>
<td>CCNA Cyber Ops*</td>
</tr>
<tr>
<td><strong>IoT</strong></td>
<td>Introduction to IoT</td>
<td>IoT Fundamentals: Connecting Things, Big Data &amp; Analytics Hackathon Playbook</td>
<td></td>
</tr>
<tr>
<td><strong>OS &amp; IT</strong></td>
<td>NDG Linux Unhatched</td>
<td>NDG Linux Essentials</td>
<td>NDG Linux I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IT Essentials</td>
<td>NDG Linux II</td>
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<tr>
<td><strong>Programming</strong></td>
<td></td>
<td>CLA: Programming Essentials in C</td>
<td>CLP: Advanced Programming in C*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPA: Programming Essentials in C++</td>
<td>CPP: Advanced Programming in C++*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PCA: Programming Essentials in Python*</td>
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</tr>
<tr>
<td><strong>Business</strong></td>
<td>Be Your Own Boss</td>
<td>Entrepreneurship</td>
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</tr>
<tr>
<td><strong>Digital Literacy</strong></td>
<td>Get Connected</td>
<td></td>
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</tr>
</tbody>
</table>

* Available within 12 months

**Notes:**
- Self-paced
- Instructor Training required
- Aligns to Certification

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**September 2017**

- NetRiders
- Internships
- Prototyping Lab
- Packet Tracer
- Hackathons
- CLP: Advanced Programming in C*
- CPP: Advanced Programming in C++*
- ETW: REST APIs with Cisco Spark*
IoT Fundamentals Curriculum

Overview
IoT Fundamentals is a multi-disciplinary hands-on curriculum teaching **how to ideate, prototype and articulate the business value of an “end-to-end IoT Solution”**. The curriculum provides a strong skills and design-thinking foundation for IoT job families that exist today and in the future.

Career Prep
The skills developed in the curriculum is the starting point to prepare for **employer-validated** entry-level job families like:

- IoT Device Management
- IoT Product Manager
- IoT Data Analytics

Learning Components
- Connecting Things course
- Big Data & Analytics course
- Hackathon Playbook
- Cisco Prototyping Lab
- Cisco Packet Tracer

Features
Develop entrepreneurial and social impact mindset through highly engaging hands-on and simulated learning activities including Prototyping Lab and Packet Tracer to develop:

- 21st Century Skills such as Creativity, Critical thinking, Collaboration and Communication
- Rapid prototyping with Sensors, Electronics and Arduino
- Use visual programming or Python to program a Raspberry Pi
- Connect with Cloud Services using RESTful APIs
- Collect, store and visualize data from sensors in real time
- Apply analytics to gain insights from data
- Present IoT solutions and their business value
IoT Fundamentals: Visual Summary

Connecting Things
- Sensors & Actuators
- Embedded Programming (FPGA)
- Network
- Cloud
- Business Model

Big Data & Analytics
- Produce data
- Analyze and tell the story from the data

Hackathon Playbook
- Ideate, design, prototype & present an IoT solution

Build an End-to-End IoT Prototype

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A New Hands-On Experience

IoT Fundamentals | Lab Experiences

Analyze the Problem with User Focus

Hands-on Design and Maker Ethos

Rapid Prototyping, Iterating, Presenting
IoT Fundamentals Approach

A Interdisciplinary Digital Foundation

...For Many IoT Career-Ready Pathways

IoT Fundamentals

- Electronics
- Programming
- Networking
- Data Analytics

IoT Data Analyst

IoT Product Manager

IoT Device Management

IoT Security

Cybersecurity

Problem solving

Design thinking

Soft skills

and many others
# IoT Fundamentals Value Proposition

<table>
<thead>
<tr>
<th>Student</th>
<th>Instructor</th>
<th>Academy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recognize and understand the concepts and challenges of the <strong>transformational IoT economy</strong>&lt;br&gt;• Gain hands-on experience with IoT technology and <strong>rapid prototyping</strong>&lt;br&gt;• Gain <strong>“IoT generalists”</strong> knowledge in a few verticals: Manufacturing, Energy, Healthcare, etc.&lt;br&gt;• Leverage networking expertise to <strong>broaden knowledge base</strong> with IoT technology&lt;br&gt;• Consider learning path to <strong>become an “IoT specialist”</strong>&lt;br&gt;• <strong>Enhance employability</strong> in both IT and non-IT fields</td>
<td>• <strong>A comprehensive, hands-on curriculum</strong> in a fast-changing emerging technology domain.&lt;br&gt;• <strong>Broaden expertise</strong> to include both networking and IoT technology&lt;br&gt;• <strong>Strengthen multi-disciplinary experiences</strong> in learning and teaching at your institution&lt;br&gt;• Align with institution’s desire to be a <strong>world-class organization</strong>&lt;br&gt;• Support students’ efforts to increase their <strong>employability</strong></td>
<td>• Strengthen institution’s reputation as a <strong>leader in teaching emerging and cutting-edge technology</strong>&lt;br&gt;• Strengthen relationship with national and local <strong>employers</strong>&lt;br&gt;• Strengthen ability to <strong>recruit students</strong>&lt;br&gt;• Enhance students’ <strong>employability</strong></td>
</tr>
</tbody>
</table>
Curriculum Differentiators
Unique competitive feature combination!

Interdisciplinary Approach
Hands-on experience at the intersection of several disciplines: Electronics, Networking, Coding, Data, Security and Business.

Maker Technologies
Highly engaging hardware kits coupled with the unique Cisco Prototyping Lab app enrich the experience.

Solution Modeling and Prototyping
Use Cisco Packet Tracer to model and simulate IoT Systems and the Cisco Prototyping Lab to quickly develop a proof of concept.

Soft Skills Integration
Stanford School of Design Thinking, Creative problem solving, and 21st century skills: Communication, Collaboration, Creativity and Critical thinking.

Cisco Enterprise Technologies
Cisco FOG computing approach, Cisco Vertical Solutions, and programming using the Cisco Spark API.

Flexibility
Integrate into existing courses or introduce new course(s) appropriate for desired Education level.
IoT Fundamentals
Learning Pathways
# IoT Fundamentals Course Summary

## Course Overview

| Connecting Things | Students learn how to securely interconnect sensors, actuators, microcontrollers, single-board computers, and cloud services over IP networks to create an end-to-end IoT system. |
| Big Data & Analytics | Students will learn how to use Python data libraries to create a pipeline to acquire, transform and visualize data collected from IoT sensors and machines. |
| Hackathon Playbook | The Hackathon Playbook is a comprehensive framework of tools and templates to prepare and run a Hackathon as a result of best practices and lessons-learned collected from the global execution of IoT Hackathons within Networking Academy and by other organizers. |

## Benefits

| Benefits | Students will develop multi-disciplinary skillsets required to prototype an IoT solution for a specific business case with a strong focus on the security considerations for emerging technologies. |
| Benefits | The transformative element of any IoT system is the data that can be collected from it. Thus the ability to extract data and using data analytics techniques to gain insights increases employability. |
| Benefits | Student reinforce and deepen their multidisciplinary IoT and data skills by defining, designing, prototyping and presenting an IoT solution to a panel of industry experts and peers. |

<table>
<thead>
<tr>
<th>Course Delivery: Instructor-led</th>
<th>Estimated Time to Complete: 40-50 hours</th>
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<tbody>
<tr>
<td>Connecting Things</td>
<td></td>
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<tr>
<td>Big Data &amp; Analytics</td>
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<tr>
<td>Hackathon Playbook</td>
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<table>
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<tr>
<th>Course Delivery: Instructor-led</th>
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</tr>
<tr>
<td>Hackathon Playbook</td>
<td></td>
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</tbody>
</table>
IoT Fundamentals
Recommended Pathways

Connect the Unconnected
- Students: connect sensors to the internet via IoT devices in order to produce data useful for automation and making more intelligent business decisions.
- Academy:
  - Easier adoption for secondary students
  - Easier to include within existing programs such as embedded programming, networking, OS&IT

Connections into Insights
- Students: use Python to create a data pipeline to acquire, manipulate and visualize sensor-generated data; see the potential of Machine Learning applications. These skills that are extremely valuable in the job market today.
- Academy:
  - For students with stronger programming and math skills
  - Increase understanding on value creation when using Big Data in the digitization of industries like Manufacturing, Energy, Automobiles

Choose the implementation that best meets your student needs and institutional program, or create your own
Sample Semester-Based Implementations

Connect the Unconnected

Secondary School Vocational Training Center
2-Year College

1 Semester

Prototype Sophistication:
IoT prototype connecting sensor to gateway and to cloud service

Connections into Insights

2-Year College
4-Year College

1st Semester
Connecting Things ➔ Hackathon Playbook

2nd Semester
Big Data & Analytics ➔ Hackathon Playbook

4-Year Engineering (compressed)

1 Semester
Connecting Things ➔ Big Data & Analytics

Prototype Sophistication:
IoT prototype connecting sensor to gateway and to cloud service and produce data visualization, data analytics.
IoT Fundamentals as Path to IoT Specialization

Foundational
- Essentials of:
  - Programming
  - Electricity
  - Networking

Career-Ready

IoT Fundamentals

Common Foundational Skills across IoT careers

Job-Specific Specialization

Digital Business Verticals require a unique combination of skillsets and knowledge

IoT Fundamentals as Capstone to “Digitize” Core Specializations

Depth
- Job-Specific Specialization

Breadth & Depth
- IoT Fundamentals

The work Students will do in traditional NetAcad specializations is evolving

Apply specialized skills across degree programs to solve a problem using IoT (& Big Data)
IoT Fundamentals Examples of Career-Ready Pathways

Ex. Infrastructure Program at a 2-Yr / Vocational College

- Intro to Cybersecurity
- IT Essentials
- Computer Technician
- CCNA R&S (ITN and RSE)
- Networking Technician
- Cisco CCENT
- Cisco CCNA R&S (ScaN and CN)
- Network Administrator
- Python
- Capstone Course

Ex. Data Science program at 4-Yr College/University

- Foundational Course
  - Connecting Things
  - Big Data & Analytics
  - Hackathon Playbook
- Advanced Data Management
- Advanced Visualization
- Scalable Machine Learning
- Unique Program Courses offered by College/University

Ex. Robotics program at Secondary School

- Intro to IoT
- Connecting Things
- Robotics Course Curriculum
-的独特课程
-独特的技能，用于进入后secondary学位或培训课程，例如
-工程
-数据科学

IoT Fundamentals Academy support resources include shared implementation scenarios across our community

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## Learning Paths Details

<table>
<thead>
<tr>
<th>Feature</th>
<th>Connect the Unconnected</th>
<th>Connections into Insights</th>
<th>Connections into Insights (compressed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Starter Path</td>
<td>Extended Path</td>
<td>Compressed Path</td>
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<tr>
<td><strong>Target Audience</strong></td>
<td>Secondary Schools</td>
<td>2-Year Colleges</td>
<td>4-Year Engineering Program</td>
</tr>
<tr>
<td></td>
<td>Vocational Training Centers</td>
<td>4-Year Colleges</td>
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<tr>
<td></td>
<td>2-Year Colleges</td>
<td>Universities</td>
<td></td>
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<td></td>
<td>Maker Spaces</td>
<td></td>
<td></td>
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<tr>
<td><strong>Instructional Hours</strong></td>
<td>70 hours</td>
<td>140 hours</td>
<td>70 hours</td>
</tr>
<tr>
<td><strong>Path in semester structure</strong></td>
<td>1 Semester: Connecting Things + Hackathon</td>
<td>1\textsuperscript{st} Sem: Connecting Things + Hackathon (70)</td>
<td>1 \textsuperscript{Sem}: Connecting Things + Big Data &amp; Analytics + Hackathon</td>
</tr>
<tr>
<td></td>
<td>2\textsuperscript{nd} Sem: Big Data &amp; Analytics + Hackathon (70)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prototype Sophistication</strong></td>
<td>IoT prototype connecting sensor to gateway and to cloud service</td>
<td>IoT prototype connecting sensor to gateway and to cloud service, producing data visualization, performing data analytics</td>
<td>IoT prototype connecting sensor to gateway and to cloud service, producing data visualization, performing data analytics</td>
</tr>
</tbody>
</table>

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Getting Ready for IoT Fundamentals
Recommended Entry Knowledge

Recommended pre-requisite knowledge for IoT Fundamentals:

- Basic TCP/IP networking including cabling and connecting devices in a LAN and to the internet.
- Familiarity with Cisco Packet Tracer, a network and IoT devices simulation application.
- Experience using any programming language to solve basic algorithmic problems.
- Foundational knowledge of physics including current, voltage, resistance, and power.

Note:
While not mandatory, taking one or more of the following Networking Academy courses enhances student learning:

Networking (one or more of the following)
- Networking Essentials
- CCNA R&S: Introduction to Networks
- IT Essentials

Programming
- PCA: Programming Essentials in Python (coming soon!)

Security
- Cybersecurity Essentials

Packet Tracer
- Introduction to Packet Tracer

IoT Fundamentals contains optional refresher material for the above skills within the instructional flow
Recommended Qualifying Skills

- Basic TCP/IP networking including cabling and connecting devices in a LAN and to the Internet.
- Familiarity with Cisco Packet Tracer, a network and IoT devices simulation application.
- Experience using any programming language to solve basic algorithmic problems.
- Foundational knowledge of physics including current, voltage, resistance, and power.

Recommended Experience

- Teaching Quantitative problem solving skills
- Business context (Professional non-academic work experience or guest speakers)

Instructor Training & Support:

1. Academies must align with an ASC.
2. Instructor Training is required for Connecting Things and Big Data & Analytics.
3. Instructors can register for training with an ITC.
or Enroll in a self-paced basic training course on their own.

NOTES:
Access enrollment links on the IoT Fundamentals Resources page on Netacad.com
Instructor Training Options

Novice in the IoT domain* or prefer in-person training

Option 1
ITC Value-Add Course

Experienced in one or more disciplines of the IoT domain*

Option 2
Online Self-Paced Course

Best in class training by a Cisco Qualified Instructor Trainer
ITC Academy training can include:
• Teaching in local language
• Supervising and coaching in-person, especially for hands-on activities
• Expanded training on prerequisite knowledge to accommodate different backgrounds
• Contextualizing training with regional or national initiatives

Most flexible solution for experienced instructors planning immediate adoption

* Ex. Maker, Teacher of embedded computing or electronics
Introduction

Cisco Networking Academy’s IoT Fundamentals curriculum provides students with a comprehensive understanding of the Internet of Things (IoT). It develops foundational skills using hands-on lab activities that stimulate the students in applying creative problem-solving and rapid prototyping in the interdisciplinary domain of electronics, networking, security, data analytics, and business. The student-centric approach translates into the student being able to ideate, design, prototype and present an IoT solution for an identified business or society need.

The interconnection of previously unconnected devices to the internet and the analysis of the data they generate are having a disruptive and transformational effect on every industry around the world. IoT is the technology that is narrowing the distance between the physical world and the digital world¹, and creating unprecedented automation in every industry. In parallel, this newly digitized world generates an increasing amount of data that can be mined to gain insights or automate smart behaviors. The
IoT Learning Opportunities
Here are some Cisco NetAcad resources to learn more about IoT and digitization.

IPD Week
The [IPD week](https://ipd.cisco.io/) live events and recordings offer many sessions related to IoT and the IoT Fundamentals curriculum.

Cisco White Paper
“Attaining IoT Value: How To Move from Connecting Things to Capturing Insights”

NetAcad Webinars
Instructors and students have access to [Technology webinars](https://www.netacad.com) with series on Cisco Meraki, Software-Defined Networks, and more.
IoT Fundamentals
Curriculum Details
Business Skills for New Global Problem Solvers
Interdisciplinary, Project-Based Problem Solving
IoT Fundamentals: Connecting Things

Course Overview

In Connecting Things, students learn how to securely interconnect sensors, actuators, microcontrollers, single-board computers, and cloud services over IP networks to create an end-to-end IoT system.

Benefits

Students will develop the interdisciplinary skillsets required to prototype an IoT solution for a specific business case with a strong focus on the security considerations for emerging technologies.

Learning Components

- Understand and explain the concepts, opportunities and challenges of digital transformation using IoT.
- Interconnect sensors/actuators, microcontrollers (Arduino), Single Board Computers (Raspberry Pi) and cloud services (Cisco Spark restful API) to create an end-to-end IoT system.
- Understand the relevant aspects of cybersecurity and privacy for an IoT solution.
- Understand how digitalization is changing vertical markets such as manufacturing, energy, and smart cars.
- Use simulation tools (Packet Tracer) to create end-to-end IoT system.

Features

- Target Audience: Secondary, Vocational, 2-year and 4-year College, 4-Year University students
- Prerequisites: Basic programming, networking and electronics
- Instructor Training Requirement: Yes
- Languages: English
- Course Delivery: Instructor-led
- Estimated Time to Complete: 40-50 hours
- Recommended Next Course: IoT Fundamentals: Big Data & Analytics or Hackathon Playbook
IoT Fundamentals: Connecting Things
Course Details

Target Audience
Appropriate for students familiar with networking technology and software programming who are interested in using digitization to help solve some of the world’s most challenging problems.

Entering Knowledge
Fundamental knowledge of any programming language with exposure to variables, arithmetic, logic, loops, and functions.
Fundamental knowledge of physics covering current, voltage, resistance, and power.

Learning Outcomes
Learn basic prototyping techniques.
Learn basic Python programming.
Build an end-to-end prototype.
Build an IoT Systems solution.
Diagram a business model for a given business or social endeavor using the Business Model Canvas.

Tools:
Raspberry Pi
Arduino
Prototyping Lab
Packet Tracer
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Chapter Titles</th>
<th>Summary Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Things and Connections</td>
<td>Understand the building blocks, the interconnections and the information flow of an IoT System.</td>
</tr>
<tr>
<td>2</td>
<td>Sensors, Actuators and microcontrollers</td>
<td>Use sensors and an Arduino microcontroller to read data from physical world and control actuators.</td>
</tr>
<tr>
<td>3</td>
<td>Software is Everywhere</td>
<td>Use Python to program a Single Board Computer (Raspberry Pi) to perform more complex embedded program.</td>
</tr>
<tr>
<td>5</td>
<td>IoT Applications in Business</td>
<td>Learn how IoT technologies are applied in diverse vertical markets: Healthcare, Smart Cities, Smart Grid, Manufacturing.</td>
</tr>
<tr>
<td>6</td>
<td>Create an IoT Solution</td>
<td>End-to-End case study on how to create an IoT Prototype.</td>
</tr>
</tbody>
</table>
IoT Fundamentals: Big Data & Analytics

Course Overview
Students will learn how to use Python data libraries to create a pipeline to acquire, transform and visualize data collected from IoT sensors and machines.

Benefits
The transformative element of any IoT system is the data that can be collected from it. Thus the ability to extract data and using data analytics techniques to gain insights increases employability.

Learning Components
• Use Python to read data from sensors and store data in a SQL database.
• Use Python Data Analysis library to clean, manipulate, integrate data sets.
• Use Python Visualization Libraries to visualize real-time data and explore acquired data sets.
• Explain the fundamental principles of a modern scalable Big Data platforms like Hadoop.
• Use storytelling to present the insights gained from extracted data.

Features
Target Audience: 2-year and 4-year College, 4-Year University students
Prerequisites: IoT Fundamentals: Connecting Things
Instructor Training Requirement: Yes
Languages: English
Course Delivery: Instructor-led
Estimated Time to Complete: 40-50 hours
Recommended Next Course: IoT Fundamentals: Hackathon Playbook
IoT Fundamentals: Big Data & Analytics
Course Details

Target Audience
Appropriate for students familiar with software programming who are interested in hands-on experience of manipulating descriptive, predictive and prescriptive data-analysis methodologies

Entering Knowledge
Fundamental knowledge of any programming language with exposure to variables, arithmetic, logic, loops, and functions
Familiar with the design, implementation and debug of simple programs

Learning Outcomes
Describe the various systems that support a typical data center
Explain how server virtualization consolidates idle resources, reduces cost and provide better services to the business
Explain how the Software Defined Networking (SDN) framework plays the key role in data center virtualization
Understand the steps of the Data Analysis Lifecycle and perform these tasks in 4 different labs using the RapidMiner and RStudio data analytics tools
## Big Data & Analytics Course Outline

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Big Data &amp; Analytics</th>
<th>Summary Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data and the Internet of Things</td>
<td>Understand the concepts of Big Data &amp; Analytics, and the role of Big Data in IoT systems.</td>
</tr>
<tr>
<td>2</td>
<td>Fundamentals of Data Analysis</td>
<td>Learn the basics of descriptive statistics, the practical aspects in acquiring data from a sensor and how to create visual representations of the data.</td>
</tr>
<tr>
<td>3</td>
<td>Data Analysis</td>
<td>Explore data using statistics and visualization to extract information and create hypotheses.</td>
</tr>
<tr>
<td>4</td>
<td>Advanced Data Analytics and Machine Learning</td>
<td>Learn about predictive analytics, the supervised and unsupervised approaches to machine learning and how to apply models to make predictions from the data.</td>
</tr>
<tr>
<td>5</td>
<td>Storytelling with Data</td>
<td>Learn how to transform analytics results into a clear and convincing narrative and visual communication.</td>
</tr>
<tr>
<td>6</td>
<td>Architecture for Big Data and Data Engineering</td>
<td>Learn the basic principles behind the most important scalable solutions for Big Data such as Apache Hadoop and the related ecosystem of technologies.</td>
</tr>
</tbody>
</table>
IoT Fundamentals: Hackathon Playbook

Course Overview

The Hackathon Playbook is a comprehensive framework of tools and templates to prepare and run a Hackathon as a result of best practices and lessons-learned collected from the global execution of IoT Hackathons within Networking Academy and by other organizers.

Benefits

Student reinforce and deepen their multidisciplinary IoT and data skills by defining, designing, prototyping and presenting an IoT solution to a panel of industry experts and peers.

Learning Components

- Inspiration: understand, select and present the problem to be solved to recruit fellow partners.
- Ideation: invent a concept that doesn’t already exist to solve a social issue. Learn how to present the solution to experts who will mentor students.
- Prototyping: create a prototyping action plan, including objects and visuals to illustrate their plan and will help an expert understand the concept and prototyping needs.
- Testing: present the concept and validate the prototype with a second expert, including user experience and enhancements.
- Presentation: present the solution and demo the prototypes to an expert panel.

Features

Target Audience: Secondary, Vocational, 2-year and 4-year College, 4-Year University students
Prerequisites: IoT Fundamentals: Connecting Things and/or Big Data and Analytics
Instructor Training Requirement: No
Languages: English
Course Delivery: Instructor-led
Estimated Time to Complete: 20-30 hours
Recommended Next Course: any Career-Ready offering from Cisco or an industry IoT training program
IoT Fundamentals: Hackathon Playbook
Course Details

Description
A set of best practices and lessons-learned collected from the global execution of numerous IoT hackathons

Target Audience
Appropriate for students familiar with networking technology and software programming who are interested project-based learning based on IoT technology

Entering Knowledge
Familiar with basic prototyping techniques
Fundamental knowledge of Python programming language

Learning Outcomes
Inspiration: select and present the problem to be solved
Ideation: present the solution to the different experts
Prototyping: create prototype action plan including objects and visuals
Testing: present the concept and validate prototype
Presentation: present the solution to the judging panel and demo the prototypes

Inspiration: select and present the problem to be solved

Ideation: present the solution to the different experts

Prototyping: create prototype action plan including objects and visuals

Testing: present the concept and validate prototype

Presentation: present the solution to the judging panel and demo the prototypes
Welcome to the Hackathon Playbook course!

This course contains all of the information needed for facilitators and students to conduct a Hackathon.

Click here to start
IoT Fundamentals
Learning Tools
As an integral part of the Networking Academy learning experience, Cisco Prototyping Lab provides

- Interactive labs using Jupyter Notebook
- Visual programming with Blockly
- Device programming with Python
- Data visualization & analytics
- Connected applications via APIs
- Rapid Prototyping

The Cisco Prototyping Lab is a comprehensive learning environment created by Cisco for Networking Academy students to learn and practice key aspects of the foundational IoT technologies. Using an engaging, hands-on approach, it supports both the learning and creative phases of the Networking Fundamentals curriculum.

This learning environment provides an easy to use, comprehensive learning environment using real devices, code, coding tools and data that students use to create the physical interconnection of an end-to-end IoT and the logical data pipeline to acquire, analyze and present data.

Features

- Prototyping Lab App
- Prototyping Lab Kit
- Raspberry Pi 3 CanaKit Ultimate Starter Kit (or equivalent)
- SparkFun Inventor’s Kit for Arduino (or equivalent)
- Cables, sensors & actuators
Packet Tracer

Tool Overview

Packet Tracer is an innovative simulation and visualization tool used for lectures, labs, games, homework, assessments, and competitions. It is embedded in these courses:

- CCNA Routing and Switching
- CCNA Security
- IT Essentials

- Intro to the Internet of Things
- Mobility Fundamentals

Career Prep

The Packet Tracer simulation-based learning environment promotes the development of essential career skills ranging from teamwork and critical thinking to creative problem solving.

- Cisco Packet Tracer (PT)
- PT Mobile Android
- PT Mobile iOS
- PT Games

Learning Components

Features

As an integral part of the Networking Academy learning experience, Packet Tracer provides

- Simulation
- Visualization
- Authoring
- Assessment
- Collaboration capabilities and facilitates the teaching and learning of complex technology concepts.
Join with us in turning the perfect storm into global opportunities

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