

Data Science Education



Online Education • Certification • Enterprise Solutions

- Data Science Fundamentals
- Al Fundamentals
- Framing and Planning Data Science Projects
- Data Understanding and Preparation for Data Science
- Data Mining Concepts & Techniques
- Hadoop Fundamentals
- Putting the Science in Data Science
- Diagnostic Analytics Using Statistical Process Control
- Prescriptive Analytics Using Simulation Models
- Data Mining in R
- Introduction to NoSQL
- > Streaming Data: Concepts, Applications, and Technologies
- Analytical Modeling, Evaluation, and Deployment Best Practices
- Data Science for the Age of Big Data



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Data science is a broad field that harnesses many disciplines to derive insights and create value from data. The multi-disciplinary field involves mathematics, statistics, advanced algorithmic computing, data mining, artificial intelligence, machine learning, data engineering, data preparation, data visualization, and application of scientific method—all within the context of business domains to which it is applied. Through applied data science, organizations are able to predict and forecast, detect patterns and anomalies, make recommendations, optimize and automate processes, and much more. Data science allows analysts, decision makers and other business professionals to challenge assumptions, ask challenging questions, frame analytical opportunities, test hypothesis and deepen their understanding of how their customers, markets, assets and competitors behave.

The frequently used and often misunderstood term data scientist is not a one-size-fits-all role. Data science involves many personas including leaders and strategists, analytic modelers, statisticians, data analysts, and data engineers. The eLearningCurve curriculum for data science is designed to provide a foundation of fundamental concepts, cover the diverse needs of many data science personas, and continuously evolve with changes in this rapidly evolving field,

WHAT PEOPLE ARE SAYING ABOUT ELC



I have come across quite a few on-line and classroom training course over the years. I have no hesitation in saying that, these courses are one of the best in the industry.

-- Sumanda Basu, CIMP Ex - Data Governance, Data Quality, USA

Full course descriptions begin on page 7.

Data Science Fundamentals

Instructors: Mark Peco, Natasha Balac

This course will cover the key concepts and practices needed for a successful data science program.

AI Fundamentals

Instructor: Natasha Balac

This course will present the basics of AI from history to modern AI with the illustrative applications of endless possibilities.

Framing and Planning Date Science Projects that Drive Business Impact

Instructor: Deanne Larson

This 3-hour online course addresses how to scope, plan, and choose a project approach for analytics project success and clearly identify the problem and opportunities to be analyzed.

Data Understanding and Preparation for Data Science

Instructor: Deanne Larson

This 3-hour online course addresses how to translate the problem statement into data sources, explore the data for relationships and recognize patterns, identify the starting inputs for the model, preparing data, and validating it for the model fitting process.

Data Mining Concepts and Techniques

Instructor: Deanne Larson

This 3-hour online course will give insight into the data mining process, explain models and algorithms, and give an understanding of how to match the right data mining models to the right problems.

Hadoop Fundamentals

Instructor: Krish Krishnan

This 5-hour online course provides an introduction to Hadoop and its inner workings and how the ecosystem was created to answer several questions for a world driven by data and e-commerce.

Putting the Science in Data Science

Instructor: Jennifer Leo

This 3-hour online course provides an overview of the scientific method within the context of solving business problems with the goal of introducing the key concepts, tools, and skills for practice.

Diagnostic Analytics Using Statistical Process Control

Instructor: Mark Peco

This 4-hour course provides an introduction to the concepts, techniques and applications of SPC within the context of information management.

Prescriptive Analytics Using Simulation Models

Instructor: Mark Peco

This 4-hour online training course provides an introduction to prescriptive analytics using simulation models applied to areas that are relevant to business analysts, operations planners, decision makers, functional managers and BI team members.

Data Mining in R

Instructor: Deanne Larson

This 3.5 online training course will show you how to use R basics, work with data frames, data reshaping, basic statistics, graphing, linear models, non-linear models, clustering, and model diagnostics.

Introduction to NoSQL

Instructor: William McKnight

This 3.5-hour online course addresses the emerging class of NoSQL technologies for managing operational big data. This includes key-value, column stores, document stores and graph databases.

Streaming Data: Concepts, Applications, and Technologies

Instructors: Kevin Petrie & Dave Wells

This 3-hour course covers the concepts, applications, and business and technical drivers for streaming data adoption, including an in-depth discussion of Apache Kafka.

Analytical Modeling, Evaluation, and Deployment Best Practices

Instructors: Deanne Larson

This 3-hour course focuses on how to match the business problem to candidate algorithms, produce comparable models, choose the best performing model, and once in production, what to do to address ongoing value.

Data Strategy for the Age of Big Data

Instructors: Asha Saxena

This 3-hour course covers the core principles of building a big data strategy to generate the business value and deep insights that an organization needs to thrive in a competitive business environment.

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CIMP: Demonstrate Mastery. Achieve Success.

Certification is an important tool for job seekers and for employers seeking to hire the most qualified people. eLearningCurve offers a robust certification program, Certified Information Management Professional (CIMP) that builds upon education to certify knowledge and understanding of information management.

The CIMP Data Science designation makes a clear statement that you have learned from the industry leaders and have demonstrated thorough understanding of data science by passing several challenging exams.

For the true experts and standard bearers in the industry we offer the second level of CIMP certification - CIMP Ex. To earn the CIMP Ex designation you must demonstrate a combination of great Expertise, Experience, and Excellence.

What Sets CIMP Apart?

Rigorous exam system: We go beyond the basics. Rather than testing for knowledge that any industry professional should know, CIMP exams test an in-depth knowledge, comprehensive understanding, and ability to apply various concepts to a problem. You can be proud of your achievement of the CIMP designation, and hiring managers can be sure they are getting a highly knowledgeable employee.

Education to support certification: We believe that the best way to ensure success is to combine meaningful industry experience with thorough academic study. To that end, CIMP exams are aligned with our courses, developed and taught by top industry educators and professionals.

Designed with busy, working professionals in mind: No time-consuming or costly travel is required to complete coursework or to take your CIMP examinations. All courses and exams are available online. All that's required of candidates is an internet connection and the desire to demonstrate mastery of data science topics and achieve success.

How Do I Enroll?

The most convenient and cost-efficient method to enroll in the CIMP program is with one of our Education Packages. Each package includes all courses and exams necessary to earn CIMP or CIMP Ex. Alternatively you can enroll in courses one at a time.

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ENTERPRISE SOLUTIONS



Today more than ever companies are watching expenses and looking for ways to streamline processes, make training convenient, and create a consistent, scalable learning environment.

Today more than ever companies are watching expenses and looking for ways to streamline processes, make training convenient, and create a consistent learning environment.

eLearningCurve Enterprise is a flexible, convenient, and cost-effective way to train your employees and ensure that all team members have access to information management training they need when they need it. Whether your team or department work in the same office, or are on the other side of the world from each other, you can train them on time and on budget with eLearningCurve Enterprise.

Why eLearningCurve Enterprise?

- > Comprehensive educational solution from a single provider
- > Employees can take the courses they need when they need them
- > Ensure all team members are trained to the same high standard
- > Train employees no matter what their geographic location
- > Employ a fully scalable education solution
- > Minimize disruption to the business
- > Maximize your employee training ROI
- > Achieve 100% information comprehension
- ➢ Get "live" time with our instructors
- Stretch your training budget
- > Get solutions for your specific needs

When you become an eLearningCurve Enterprise Customer

We'll work with you to develop educational programs for different roles, positions, teams, departments, and manage and track enrollment of all students in online classes and CIMP exams. We'll rack and report educational progress for each student and work with you to meet any specific educational needs.

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ELEARNINGCURVE ENTERPRISE BENEFITS

PARTNERSHIP: Comprehensive educational solution from a single provider. We'll be your educational "partner-for-life" providing

employees with continuous information management education they need over the course of their careers.

FLEXIBILITY: Employees can take the courses they need when they need them. Our flexible program allows employees to take the courses they need when they need them to best suit their role, projects, backgrounds or interests.

CONSISTENCY: Ensure all team members are trained to the same high standard. Train

your existing team, and set up courses for new hires and transfers. Consider CIMP exams to verify that your employees utilize the same methodology, techniques, and terminology.

SCALABLITY: Select an Education Partner who truly understands scalability. Roll out to a few employees, or your entire organization. Our solution can quickly and effortlessly accommodate groups of all sizes, even if they are geographically dispersed.

BREADTH: Acquire comprehensive education

and certification. We offer a full information management education. We have you covered with a comprehensive set of courses, exams, and certifications designed to impart knowledge, test understanding, and validate learning.

LOCATION: Train employees no matter what their geographic location. Overcome

geographical barriers to training. You can train your entire team whether they are in the same office, or on the opposite sides of the world. Everyone can access our online courses from any place at any time.

LOGISTICS: Minimize disruption to the

business. Our online format allows employees to study from their office or home, allocate full training days, or study an hour a day during lunch breaks.

ROI: Maximize your employee training ROI.

No need to worry about paying for flights, hotels and other travel expenses. 100% of what you spend goes towards learning, thus achieving top quality education at a fraction of the cost of in-person training.

RESULTS: Achieve 100% information

comprehension. Learn from top industry experts in information management topics. Study at your own pace, listen to the material many times, and test your knowledge through CIMP certification exams.

SAVINGS: Stretch your training budget.

We offer various pricing options including volume discounts, pay-as-you-go model with increasing discounts, and other alternatives.

"LIVE" INTERACTION: Spend time with our

instructors. Organize question and answer meetings (via Webinar) with course instructors for groups of students who complete online courses.

INFORMATION MANAGEMENT 101 Mini-

classes. As a benefit to our enterprise customers we offer a certain number of complimentary licenses for our 101 mini-classes.

CUSTOME COURSEWARE: Get solutions for

your specific needs. Tell us which courses your organization needs the most. We'll work with top instructors in the industry to meet your needs in the most expedient manner.

Data Science Fundamentals

Instructors: Mark Peco & Natasha Balac Duration: 5 hours

Data science has matured into a cross functional discipline. In simple terms, its main purpose is to extract meaningful information from a variety of data sources. This definition is very general and must be explored in more detail to understand the building blocks needed for success. Related workgroups must understand each other and work together to make meaningful impact.

Effective data science is a critical enabler for companies to become "data-driven" and to "compete on analytics". To give shape to data science as a discipline, this course introduces core principles and concepts to provide a solid foundation of understanding. Data science is described in terms of its, purpose, capabilities, techniques, approaches and skills. It's dependencies on other disciplines and how it enables value creation within the broader "data-driven" ecosystem is also provided.

This course introduces data science and sets the stage for understanding how process, data, skills, culture, methodology and technical building blocks collectively drive results.

You will learn to:

- Key concepts needed for successful data science
- > How data science relates to other related disciplines
- Practical data science process lifecycle steps
- Common data science tools, techniques and modeling categories
- Recommended data science approaches, methods and processes
- > The data science process
- > Critical success factors for data science
- Why organizational culture and data literacy are challenges that must be managed

This course is geared towards:

- Business managers and executives
- Technology managers and executives
- > Data science and data engineering team members
- > Business analysts, statisticians and modelers
- Process managers and decision makers
- > Business measurement and performance analysts
- IT analysts and developers
- Data management analysts
- > Technology and business architects
- Analytics, business intelligence, data science and data engineering program leaders
- Anyone with an interest in understanding the capabilities, opportunities and challenges offered by data science

Course Outline

About the Course (10 min)

Setting the Stage (60 min)

- Basic Concepts
- Value Chain Analysis
- Thinking Styles
- Research Methods

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Introducing Data Science (49 min)

- Data Science Concepts
- Aspects of Science in Data Science
- o Value Framework
- Module Summary

Being Data Driven (26 min)

- Pursuit of Value
- Data Driven Organizations
- Success Factors

Data and Technology Landscape (88 min)

- Big Data The Open Catalyst
- Data Resources
- o Data Management
- Discovery and Exploration
- Model Building
- Model Execution and Analysis
- Interpretation and Storytelling

Modeling and Analysis Techniques (55 min)

- Problem Framing
- Research Methods
- Modeling Techniques
- Model Deployment

Framing and Planning Data Science Projects that Drive Business Impact

Instructor: Deanne Larson Duration: 3 hours

Data Science projects often fail due to unclear scope, lack of project planning, and lack of clear alignment to business objectives. This 3-hour online course addresses how to scope, plan, and choose a project approach for analytics project success and clearly identify the problem and opportunities to be analyzed. Framing and planning drives all of the other phases of data science projects. Based on the CRISP-DM analytics lifecycle this course describes the purpose, activities, and deliverables for the first phase of that lifecycle.

You will learn:

- Clearly define a problem statement or question of interest
- Define an analytic project including scope and methodology approach
- Create a project plan to manage the analytics project
- Establish stakeholder management and expectations

This course is geared towards:

- Data scientists, data analysts, and business analysts who need to frame analytics problems and choose the most effective ways to solve those problems
- Aspiring data scientists and data analysts
- Business and technical managers who need to understand the nature of analytics and data science work
- Data engineers and analytics developers who work with data scientists

Course Outline

About the Course (2 min)

Opportunity and Problem Modeling (39 min)

- o Data Science
- Problem or Opportunity
- Thinking Styles
- The Stage Process
- Influence Modeling
- Kernel Seeking Modeling
- Causal Modeling
- Characteristics of a Good Problem Statement
- o Define the Problem or Opportunity Example

Data Science Project Charter (20 min)

- What is a Charter?
- o Benefits of a Charter
- Project Approach and Outcomes
- Success Measures
- Assumptions
- o Resources
- o Constraints
- o Milestone Schedule
- o Budget
- Project Stakeholders
- o Data Science Key Roles

Data Science Project Methodology (26 min)

- Data Science Methodologies
- Cross Industry Standard Practices
- o Team Data Science Process
- Agile SCRUM Process
- Data Science Methodologies review
- o Data Science Analytical Technology
- Data Science Infrastructure Technology

Data Science Project Scope (58 min)

- Project Type and Maturity
- o Problem Statement to Project Type
- o ABC Airlines
- o Other Project Considerations
- Scope & Key Deliverables

Data Science Project Plan (15 min)

- o Data Science Project Plans
- o Project Kickoff
- o Data Science Project Plan Image
- o Project Plan Work Packages
- Data Science Project Plan Review

Additional Documents (22 min)

- Data Science System Architecture Data Science System Architecture
- Data Science Data Definitions
- Data Science Summary Report
- Data Science Model Report Part 1-2
- Data Science Exit Report: Overview
- Data Science Exit Report: Benefits
- Data Science Exit Report: Learnings

Data Understanding & Preparation for Data Science

Instructors: Deanne Larson Duration: 3 hours

One challenge in the data science lifecycle is understanding the problem or opportunity, the next challenge is acquiring, understanding, and preparing data for the modeling phase. This step in the data science process is estimated to take up to 50% of the time allotted for a data science project.

This course addresses how to translate the problem statement into data sources, explore the data for relationships and recognize patterns, identify the starting inputs for the model, preparing data, and validating it for the model fitting process.

You will learn:

- Review the data science project methodology
- Understand data source identification
- Evaluate data findings to determine and validate modeling techniques
- Review feature selection techniques
- Understand data preparation techniques
- Planning for data pipelines
- Understand data visualization techniques for data understanding and data preparation

This course is geared towards:

- Review the data science project methodology
- Understand data source identification
- Evaluate data findings to determine and validate modeling techniques
- Review feature selection techniques
- Understand data preparation techniques
- Planning for data pipelines
- Understand data visualization techniques for data understanding and data preparation

Course Outline

About the Course (2 min)

Introduction to Crisp DM (21 min)

- The Data Science Process
- Supervised Learning
- Unsupervised Learning
- Define the Problem or Opportunity
- Define the Data Sources

Module 2. Data Sources Identification (20 min)

- Data Understanding
- Data Sources and the Problem Statement
- Data Source Inventory
- Preparing for Exploratory Data Analysis

- o Data Modeling and Data Science
- Data Pipelines and Data Stores
- Work with the End in Mind

Exploratory Data Analysis (37 min)

- Data Understanding
- Exploratory Data Analysis
- o Data Understanding Data Profiling
- o Sampling Size
- Data Profiling EDA Methods
- Sample Quality
- Statistics Basics: Attributes
- Summary Statistics
- Distribution
- o Data Relationships
- Results of Data Profiling
- Findings Important Variables
- Outcomes and Interpretations
- o EDA Checklist

Data Preparation for Modeling (30 min)

- Data Preparation
- Feature Selection
- Data Quality Report
- Feature Scaling and Standardization
- Subset Selection
- o Transform for Data Modeling
- o Data Ready State
- Modeling Create and Train a Model
- Cross Validation

Data Pipelines (10 min)

- What are Data Pipelines?
- Why are Data Pipelines Important?
- o Data Pipelines and Data Science

Visualization Techniques (33 min)

- Data Description
- Data Evaluation
- o Data Quality Report
- Data Cleansing
- Data Quality Scorecards and Dashboards
- Feature Ranking

Data Quality and Integrity (36 min)

- Data Quality and Machine Learning
- o Accurate Data
- o Consistent and Complete Data
- Algorithms and Data Quality
- o Bins and Ranges
- High Cardinality
- Reduce Cardinality
- o Dealing with Outliers
- Missing Data
- Time of Event

Data Mining Concepts and Techniques

Instructor: Deanne Larson Duration: 3 hours

Data mining originated primarily from researchers running into challenges posed by new data sets. Data mining is not a new area, but has re-emerged as data science because of new data sources such as Big Data. This course focuses on defining both data mining and data science and provides a review of the concepts, processes, and techniques used in each area.

This 3-hour online course will give you insight into the data mining process, explain models and algorithms, and give an understanding of how to match the right data mining models to the right problems.

You will learn:

- > The definitions of data mining and data science
- > The role of statistics in data mining
- Machine learning concepts
- To differentiate between supervised and unsupervised learning
- > The data mining process
- > How to conduct exploratory data analysis
- > To identify data mining models and algorithms
- > How to match the problem with the model
- Model validation techniques
- How to deploy data mining models

This course is geared towards:

- Analysts looking to gain foundational data mining knowledge
- Analysts looking to understand data mining models
- Analysts looking to apply the right data mining models to the right problem
- Attendees should have a basic understanding of undergraduate statistics, data types, databases, and data management concepts

Course Outline

About the Course (3 min)

Introduction to Data Mining (25 min)

- o Module Overview
- What is Data Mining?
- o Statistics in Data Mining
- Machine Learning
- Supervised Learning
- Unsupervised Learning

The Data Mining Process (24 min)

- Data Mining Framework
- Data Mining Approaches
- Data Mining Techniques
- Data Mining Process

Exploratory Data Analysis (29 min)

- Exploratory Data Analysis
- Data Profiling: Uncovering Structure
- Data Profiling: Types of Profiling
- Descriptive Statistics
- Results of Data Profiling Data Relationships
- Findings Important Variables
- Visualization Techniques
- Outcomes and Interpretations
- o Sampling Size
- Sample Quality
- Big Data Considerations
- Feature Selection
- o EDA Checklist

Data Mining Models and Algorithms (71 min)

- Build the Model
- Anatomy of a Model
- What is a Classification Problem
- Classification
- Ensemble Methods
- Clustering
- Clustering Uses
- Association–Market Basket
- \circ Association Rules
- Association Uses
- o Application of Data Mining Models
- Model Selection

Model Validation Techniques (18 min)

- The Validation Process
- Fitting a Model
- o Bias/Variance Tradeoff
- Regression Mean Squared Error
- Linear Regression Confidence and Prediction Intervals
- Logistic Regression Significance Test
- Classification Accuracy
- Classification Accuracy Other Measures
- Prediction Error Methods
- Hold-Out Cross Validation
- o K-Fold Cross Validation Method

Deploying Data Mining Tools (9 min)

- o Overview
- o Deploying Data Mining Models
- Course Summary Parts 1 & 2
- o References

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Hadoop Fundamentals

Instructor: Krish Krishnan Duration: 5 hours

The world of data has transformed into an economy that can provide several insights to thrive in the world of business. The need of the hour is to ingest and acquire data as fast as possible, and more important than the acquisition, is the ability to fail fast and move at agile speeds to provide better data insights with analytics. How can we do this without a database? The answer is an introduction to the world of Hadoop.

Implementing big data platforms for data exploration, discovery, and analytics within a Business Intelligence (BI) program provides capabilities to leverage existing BI programs and add new insights and methods that relate to, and process data for, the enterprise.

This 5-hour online training course introduces Hadoop and its inner workings and how the ecosystem was created to answer several questions for the world driven by data and ecommerce. We have tailored this course to be focused on areas that are relevant to business analysts, decision makers, functional managers and BI team members. The basic concepts are introduced and the course is optimized to provide an overview of the breadth of potential opportunities for Hadoop within diverse organizations.

You will learn:

- Limitations of databases
- > Search and Google ecosystem growth
- Apache Nutch
- Hadoop ecosystem
- Hadoop internals
- Hadoop 1,2 and 3

This course is geared towards:

- > Architects, developers
- Business analytics team members
- Executives, decision Support Teams

Course Outline

About the Course (7 min)

Foundations of Hadoop (45 min)

- Speed in Compute
- o Internet
- American Online (AOL) Way to Connect to the Internet
- Netscape Popular Dot-Com Portal
- Google The First Search Engine
- Search Process
- o Nutch

- o Yahoo
- Hadoop Creation History
- o Hadoop Today
- o Facebook
- \circ LinkedIn

Hadoop Core Modules: Part 1 (87 min)

- Perspective Food For Thought
- Why Hadoop?
- Human Behavior New Insights
- o Twitter Example
- Forces Shaping Business
- Conundrum
- \circ $\,$ The New Data Fabric
- o Big Data
- o CIO Continuum
- o Architect's Thinking
- o User Needs
- o State of Data
- \circ $\;$ What is Apache Hadoop
- Hadoop Design Goals
- o Stack
- Core Components
- Storage: Hadoop Distributed File System (HDFS)

Hadoop Core Modules: Part 2 (57 min)

- Compute: MapReduce and Yet Another Resource Navigator (YARN)
- Operating System: YARN
- Services Management: Zookeeper
- Hadoop 3.0: More Enterprise Features

Hadoop Ecosystem Components: Part 1 (78 min)

- HBASE: Columnar Database
- PIG: Dataflow
- TEZ: Accelerator
- o In-memory: Spark
- Data Ingestion: AVRO

Hadoop Ecosystem Components: Part 2 (SQL on Hadoop) (34 min)

- Apache Hive
- o Impala
- Apache Drill
- Security in Hadoop
- Workflow
- Hadoop Technical Architecture

Putting the Science in Data Science

Instructors: Jennifer Leo Duration: 3 hours

Research methods are critical to the process of addressing business challenges and finding solutions. Research methods and experimental design can be used across multiple disciplines to help you answer questions and inform decision making. In order to do so, it is essential that you ask the right questions, identify and use the tools that will gather rich data sources, analyze the results using statistical and coding strategies, and apply visualization techniques to illustrate and represent the findings.

Drawing on business analytics, this course will use a scientific approach to introduce the concepts, tools and skills that are critical to designing and executing experiments to solve business problems. The process of using research methods to ask questions, design experiments to test a hypothesis, identify data collection methods and techniques, and analyze the results to find business solutions will lead to more informed decision making. Using the scientific method, this process involves gathering data, determining what to do with it, and deciding how to visualize and illustrate what you have learned.

This course provides an overview of the scientific method within the context of solving business problems with the goal of introducing the key concepts, tools, and skills for practice. It also introduces the critical human aspects, including team composition and the soft skills that will help you communicate the findings and publish your results. To apply the concepts learned, examples will be introduced throughout and a case study will be used to summarize the course.

You will learn:

- > The key features of the scientific method
- How to design an experiment
- Criteria for selecting data collection methods
- Strategies to analyze experimental results
- How to launch and execute an experiment, including key factors to consider
- Examining your results
- Approaches to visualize finding and communicate results
- To apply the scientific method within a business context

This course is geared towards:

- Data Science team members
- Business Intelligence professionals
- Data Analytics practitioners
- Business Analysts
- Process improvement professionals
- Functional business managers
- Business transformation leaders
- Data management professionals
- > Data governance team members
- Operational and strategic planners

Course Outline

About the Course (4 min)

Introduction to The Scientific Method (23 min)

- o Defining Research
- Key Features of the Scientific Method

Designing an Experiment (34 min)

- What Do We Mean by "Experiment"?
- Designing an Experiment: A "How To" Approach
- Now What?
- o Analyze Your Data
- Make Conclusions
- o Share Findings

Executing an Experiment (52 min)

- Collecting Data
- o Surveys
- Conducting Observations
- \circ Interviews
- Open Data
- Data Collection Tips
- Readiness Checklists

Communicating the Results (31 min)

- Getting Started
- Work Backwards
- o How to Give Life to Your Numbers
- Know Your Audience
- Use Appropriate Language
- Making the Most of Data Visualization
- o Charts to Visualize Data
- Writing Your Report
- Digital Storytelling

Case Study (34 min)

- o Setting the Scene
- Identify the Gap
- Ask the Question
- o Multi-Phase Approach
- o Evaluating Impact: Experimental Design
- Collect Data: Data Collection Tools
- Key Data To Measure
- Recruiting Participants
- Experimental Design Overview
- Qualitative Research Design
- o Analyze Data: Data Analysis Approach
- Results-What Did We Find?
- $_{\odot}$ $\,$ Visualizing the Results

Diagnostic Analytics Using Statistical Process Control

Instructor: Mark Peco Duration: 3 hours, 50 minutes

The field of Diagnostic Analytics includes the capabilities to detect abnormal conditions and to estimate root causes to those conditions.

This course is focused on the "detection" aspect of diagnostic analytics and introduces Statistical Process Control (SPC) as a suitable approach for defect detection. Root cause analysis of the identified defects is beyond the scope of this course.

SPC includes a set of analytical techniques that measure and detect abnormal changes in the behavior of a managed process. SPC helps managers respond to unexpected changes in critical variables and take corrective action as necessary to maintain the desired levels of product quality and process performance over time.

This online training course provides an introduction to the concepts, techniques and applications of SPC within the context of information management practices and processes. The theory of SPC is introduced and the design of control charts is discussed as a basis for describing how a diverse range of data and process quality management challenges can be addressed.

You will learn:

- > Methods for detecting defects/abnormal conditions
- Define some common process building blocks
- > The concepts and theory behind "statistical control"
- How statistical methods can be used to measure and estimate process variation
- Identify and categorize major causes of process variation
- > How process variation is related to product quality
- The principles of control charts used to detect and generate process alarms
- Present the basic concepts of quality management initiatives and practices and how it relates to the scope of Statistical Process Control
- Describe how to apply solutions to address process, data and related quality management challenges
- Provide the context necessary to implement effective solutions

This course is geared towards:

- Data quality analysts
- Data Integration specialists
- Process improvement analysts
- Business analysts
- Data warehousing team members
- BI program managers and team members
- Functional business managers
- Anyone who wants to learn how statistical concepts can be applied to improve the quality of data and information and its various management processes

Course Outline

About the Course (8 min) Introduction to SPC (38 min)

- o Basic Definitions
- Understanding Variation
- SPC and Quality Management

Control Charts (56 min)

- Basic Statistics
- o Control Chart Fundamentals
- Types of Control Charts
- Control Chart Design Considerations

SPC Applications (66 min)

- Application Areas of SPC
- Role of SPC in Process Management
- Operations Improvement Example
- Real Time Process Monitoring Example
- Master Data Interface Monitoring Example
- Data Quality Monitoring Example
- Business Performance Monitoring Example

Beyond the Basics (65 min)

- Improving Control Chart Performance
- o Analyzing Process Capability

Prescriptive Analytics Using Simulation Models

Instructor: Mark Peco Duration: 4 hours

Prescriptive analytics enables managers to explore different scenarios and evaluate new business opportunities by playing the "what-if" game. It enables the evaluation and comparison of different options as part of the decision making process. This leads to a deeper understanding about how to define and achieve business and operating goals.

Implementing prescriptive analytics using simulation methods within a Business Intelligence (BI) program provides additional capabilities to existing BI programs. Answers to advanced business questions starting with "why" and "what if" can now be answered. Maintaining the models in a calibrated and reliable manner over time requires rigorous data management practices based on principles of integration and quality.

This 4-hour online training course provides an introduction to prescriptive analytics using simulation models applied to areas that are relevant to business analysts, operations planners, decision makers, functional managers and BI team members. The basic concepts are introduced and a framework is provided that positions simulation analytics within a broader BI Program. Categories of models are described that provides an overview of the breadth of potential opportunities for prescriptive analytics within diverse organizations.

You will learn:

- Basic capabilities of simulation
- Categories of models and modeling techniques
- Domains of applicability
- > How to build and implement simulation models
- Data management requirements for simulation
- How business problems can be defined and solved
- The role of experimental design
- How insights can be generated
- How to explore and discover possible routes to successful outcomes
- How business intelligence, analytics, and simulation are related disciplines

This course is geared towards:

- BI program leaders
- BI architects and project managers
- Business analytics team members
- Business managers and decision makers
- Functional analysts
- Operations managers
- Process improvement specialists

Course Outline

About the Course (8 min) Introduction (54 min)

- Basic Concepts
- Capabilities of Simulation
- Business intelligence Framework
- Simulation Framework

Principles and Practices (38 mins)

- Context and Opportunities
- Application Areas
- o Systems Models
- o Model Components
- o System Simulation

Modeling Techniques - Part I (60 mins)

- o Overview
- o Continuous Physical Models
- o Business Process Models
- Stock and Flow Models

Modeling Techniques – Part II (43 mins)

- Monte Carlo Models
- Discrete Event Models
- Empirical Models

Simulations (49 mins)

- Opportunities and Techniques
- o Data Management Considerations
- Simulation and the BI Program
- Case Study

Introduction to NoSQL

Instructor: William McKnight Duration: 3 hours, 30 minutes

In this informative class, learn about the emerging class of NoSQL technologies for managing operational big data. This includes key-value, column stores, document stores and graph databases. Learn about the ideal workloads for NoSQL in enterprises and where NoSQL adds value to an enterprise information strategy. Learn how to get the projects started or dropping the "not in production" label.

This "code-lite" session addresses the NoSQL community as well as the key user community, providing guidance on how NoSQL technologies work and how to penetrate the enterprise. This practical session will help you add a significant class of technologies into consideration to ensure information remains an unparalleled corporate asset.

You will learn:

- Big data basics
- Enablers for NoSQL
- > NoSQL data models: key-value, document, graph
- NoSQL usage patterns
- NoSQL database architectures
- Graph database modeling and architecture

This course is geared towards:

- Big data basics
- Enablers for NoSQL
- NoSQL data models: key-value, document, graph
- NoSQL usage patterns
- NoSQL database architectures
- Graph database modeling and architecture

Course Outline

About the Course (8 min)

Big Data Overview and Common Themes (49 min)

- No More One Size Fits All
- The No Reference Architecture
- The Relational Database Data Page
- What Does Big Data Mean?
- Google Search Trends
- Why the Sudden Explosion of Interest
- What Happens in an Internet Minute?
- o Sensors Data
- o Customer Demands Drive Technology
- New Data Types
- Benefits of JSON
- Why NoSQL for Big Data?
- o ACID
- Hadoop, MapReduce and Big Data
- Why NoSQL Not Hadoop for Operations
- MapReduce Part 1 & 2
- Scale Up vs. Scale Out

- o DFS Block Placement Example
- File System Summary

NoSQL History & Jargon (17 min)

- NoSQL Inspirations
- NoSQL History
- o Google MapReducer Paper
- o Google Bigtable Paper
- o Memcached
- o Schemaless
- o Keeping it Simple
- CAP Theorem Part 1 & 2
- o Automatic Sharding
- NoSQL Node Specification

Enablers for NoSQL (19 min)

- Data Integration
- o Data Visualization
- o Infrastructure Strategy, Including Cloud
- o Traditional Data Modeling
- Data Modeling for NoSQL
- NoSQL is for Applications, Not DW or ERP
- NoSQL Schemaless Data Modeling
- Force Fitting Unstructured Data NoSQL Modeling from RDBMS
- o Security Concerns
- o Easing Into Change
- What Will Motivate IT to Adopt NoSQL?

NoSQL Data Models (49 min)

- Data Types and NoSQL Data Models
- Key Value Stores
- o Document Stores
- o Column Stores
- o Operational Big Data Platform Solution
- Multiple NoSQL Solutions

Relationship Model: Graph Oriented (68 min)

- o Module Overview
- o The Graph Database Revolution
- o Relationship Data
- Graph Algorithms
- $\circ \quad \text{Use Cases}$
- o Graph Modeling
- o Property Graph Databases
- o Semantic Graph Databases
- o Graph Engines
- 0

The Future of NoSQL (8 min)

- \circ Overview
- o Questions for your NoSQL Prospect Vendor
- o Future of NoSQL
- o Big Data and NoSQL Sales Projection
- The NoSQL Challenge
- o Getting Started
- What Technology to Select

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Data Mining in R

Instructors: Deanne Larson Duration: 3.5 hours

With increasing interest in big data, the topic and skills of data mining get new attention, including strong interest in the value that can be derived from large data sets. Data mining is the process of selecting, exploring, and modeling large amounts of data to uncover previously unknown information for business benefit.

R is an open source software environment for statistical computing and graphics and is very popular with data scientists. R is being used for data analysis, extracting and transforming data, fitting models, drawing inferences, making predictions, plotting, and reporting results. This online training course will show you how to use R basics, work with data frames, data reshaping, basic statistics, graphing, linear models, non-linear models, clustering, and model diagnostics.

You will learn:

- R basics such as basic math, data types, vectors, and calling functions
- Advanced data structures such as data frames, lists, and matrices
- > R base graphics
- R basic statistics, correlation, and covariance
- Linear models such as decision trees and random forests
- > To apply clustering using K-means
- Model diagnostics

This course is geared towards:

- Data analysis and business analytics professionals
- Anyone interested to learn data mining techniques to find insights in data, and who has some statistical and programming experience

Course Outline

About the Course (4 min)

Introduction to R Studio (20 min)

- \circ Overview
- o What is R
- What is RStudio
- Why RStudio?
- Navigating RStudio
- o R Environments

R Basics (34 min)

- \circ Overview
- o R Math
- o R Data Types
- Working with Data Structures
- Loading Data
- Writing Data
- o Summary

Introduction to Data Mining in R (89 min)

- \circ Overview
- Exploratory Data Analysis
- o Base Graphics in R
- o Linear Regression
- Logistic Regression
- Summary

Classification and Clustering Models in R (56 min)

- \circ Overview
- o R Math
- R Data Types
- o Working with Data Structures
- o Loading Data
- Writing Data
- o Summary

Artificial Intelligence Fundamentals

Instructor: Natasha Balac Duration: 4 hour 45 minute course

Artificial Intelligence (AI) is a field that is continually and actively growing and changing, expanding human capability beyond imagination. All has captured the attention of scientists, engineers and business people across industries worldwide exploring ways to find insight and create value from smart applications and product.

This course presents the basics of AI from history to modern Al with the illustrative applications of endless possibilities. We will examine how AI already impacts every aspect of our daily lives and explore emerging AI based technologies with examples of applications and implications as well as opportunities. To understand some of the deeper concepts, such as natural language processing, face recognition and autonomous driving, we will explore several basic AI concepts: four major types of AI as well as machine learning, logic and planning, probabilistic technology, deep learning, and neural networks.

You will learn to:

- Demonstrate fundamental understanding of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI to problem that require 0 inference, perception and learning.
- Demonstrate awareness and a fundamental 0 understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks, autonomous vehicle and other machine learning models
- Demonstrate an ability to share in discussions of AI, 0 its current scope and limitations, and societal impact

This course is geared towards:

- Business managers and executives
- Technology managers and executives 0
- Data science and data engineering team members
- Process improvement professionals
- o IT analysts and developers
- Data management analysts 0
- Technology and business architects 0
- Analytics, business intelligence, data science and 0 data engineering program leaders
- Anyone with an interest in understanding the 0 capabilities, opportunities and challenges offered by artificial intelligence

Course Outline

About the Course (6 min)

Al In Everyday Life (48 min)

- Introduction 0
- Ubiquitous AI is the "New Normal" 0
- Great Benefits of AI Across Industries 0
- Al In Everyday Life 0

Al Introduction (44 min)

- What is AI? 0
- Artificial Intelligence in Real Life 0
- Al Popularity 0
- What Drives AI Popularity? 0
- AI is Enjoying Significant Hype and 0 Investment
- Definition of AI 0
- AI Purpose and Goals 0
- Short History of AI 0
- The Foundations of AI 0

Intelligent Systems (44 min)

- What is Intelligence Composed Of? 0
- What AI Should be Able to Do? 0
- Types of AI Systems: Parts 1 & 2 0
- Act Rationally/Act Like a Human 0
- Systems that Act Like Humans 0
- Systems that Think and Act Rationally 0
- Systems that Act Rationally 0

Search (50 min)

- Search Algorithms Breadth-First Search 0
- Depth-First Strategy 0
- **Bidirectional Strategy** 0
- Uniform Cost Search 0
- Comparison of Strategies 0
- Informed or Heuristic Search 0
- Local Search Algorithms 0

Planning & Expert Systems (35 min)

- 0 Planning
- Formal Definition of Planning 0
- **Basic Planning Algorithms** 0
- Formalizing Planning Problems 0
- Forward Chaining Planning 0
- **Backward Chaining** 0
- **Expert Systems** 0

Learning (62 min)

- 0 Learning
- **Deep Learning** 0
- Natural Language Processing 0
- Robotics 0
- Self-Driving Vehicles 0
- 0 Self-Driving Cars Impact
- AI Issues 0
- Ethical Issues in Al 0

Streaming Data: Concepts, Applications, and Technologies

Instructors: Dave Wells & Kevin Petrie Duration: 3 hours

The analytics opportunities with IoT and application data streams are abundant, but the value of streaming technology is not limited to native data streams. In today's fast paced business world, the need for fast data is pervasive and tacit acceptance of high-latency data is rapidly diminishing. Streaming as an alternative to batch ETL is a practical way to meet the demand for fast data.

Change Data Capture (CDC) is a category of technology that captures data about changes made to a database – inserts, updates, and deletes – and makes that data available to downstream processing such as data pipelines that flow to data warehouses and data lakes. CDC can be combined with streaming to accelerate data flow and reduce data latency.

You'll need to know the actions and responsibilities of data producers and of data consumers, as well as the capabilities for cluster management, data connections, and APIs. Integrating Kafka or other streaming technologies into your data ecosystem is an important consideration.

You will learn:

- The business and technical drivers for streaming data adoption
- Data pipeline processing patterns and the advanced patterns that are possible with streaming
- Use case patterns and a variety of use cases for streaming data
- Five kinds of Change Data Capture (CDC) and the strengths and weaknesses of each
- The concept and applications of streaming first architecture
- Kafka architecture and essential components
- Kafka data and process flow
- The roles and functions of Kafka broker, data producers, and data consumers
- Cluster management, data connections, and APIs with Kafka
- Integrating streaming into the data ecosystem

This course is geared towards:

- > Data and analytics leaders and managers
- Data and analytics architects
- Data scientists
- Data engineers
- Data governance professionals who need to understand the opportunities and implications of streaming data
- Anyone with a desire to know how streaming is changing the data management landscape

Course Outline

About the Course (5 min) The Need for Speed (21 min)

- Batch Vs. Real Time
- The Speed of Business
- The Speed of Data Parts 1-3
- Fast Data Drives the Consumer World
- Fast Data Drives the Business World
- Fast Data Drives the Analytic World
- The Business Case for Fast Data

Moving Data through Pipelines (61 min)

- Data Pipeline Processing
- Data Stream Processing
- \circ $\,$ IoT and Edge Computing $\,$

Change Data Capture (10 min)

- Data Management A New Streaming Use Case
- What is CDC?

Streaming First Architecture for Data Management (17 min)

- Modern Enterprise Dara Requirements
- Essential Characteristics of Streaming Technology
- Stream Processing Technologies
- Kafka Stream Processing Basics
- Replacing ETL with CDC and Streaming
- Streaming First Architecture
- Moving to Streaming First Architecture

Data Streaming with Apache Kafka (11 min)

- Introduction to Apache Kafka
- o Kafka Predecessors

Kafka Architecture (19 min)

- o Apache Kafka Architecture
- Essential Components Part 1-2
- Data and Process Flow Part 1-2
- Kafka Record Key Components
- o Kafka Broker Overview
- o Cluster Management with Apache

Data Stream Ecosystems and Use Cases (40 min)

- o Data Streaming Use Cases
- \circ $\;$ Streaming Integration with Data Ecosystems $\;$
- Kafka Alternatives from Cloud Service Providers
- o Amazon Kinesis
- o Azure Event Hub
- Google Cloud PUB/SUB

Full outline: <u>https://ecm.elearningcurve.com/Online_Data_Science</u>

Analytical Modeling, Evaluation, and **Deployment Best Practices**

Instructor: Deanne Larson **Duration: 3 hours**

Understanding the business problem provides insight into the data needed as well as what algorithms to consider. A choice of what algorithm to use is a challenging one as there can be several that may address the same business problem. This 3-hour course focuses on how to match the business problem to candidate algorithms, produce comparable models, choose the best performing model, and once in production, what to do to address ongoing value. consideration.

You will learn:

- > How to match the problem to the analytical model
- How to choose a relevant algorithm
- How to evaluate models for the best option
 How to prepare for model deployment
- How to monitor models
- > How to support model operations

This course is geared towards:

- Business analysts
- Data analysts
 Data scientists
- Project leads
- > Business subject matter experts that support data science projects

Course Outline

About the Course (2 min)

The Modeling Process (30 min)

- The Data Science Process
- > Types of Data Science Projects
- > Modeling
- Project Type and Maturity
- Data Science Starting Point
- Other Modeling Considerations

Overview of Common Algorithms and Uses (68 min)

- Data Science Framework
- > Approaches
- > Techniques
- > Algorithms
- Anomaly Detection

Tools for Model Evaluation (24 min)

- Evaluation
- Bias/Variance Tradeoff
- Train and Test Sets
- Assessment of Results
- Hold-out Cross Validation
- K-fold Cross Validation Method
- Regression Mean Squared Error
- Linear Regression Confidence and Prediction Intervals
- Logistic Regression Significance Test
- Classification Accuracy
- Classification Accuracy Other Measures
- Prediction Error Methods
- o ROC Curve
- Evaluation Customer Acceptance

Module 4. Preparing for Deployment (11 min)

- Deployment
- Deployment Working Software
- Data Pipelines
- Data Pipelines Part of Deployment: Part 1 2
- Deployment Operationalization
- Monitoring Models Dashboard
- Life of the Model

Module 5. Model Operations (18 min)

- Model Operations: Part 1 2
- Data Ingestion
- Data Storage
- Data Integration and Synthesis
- o Data Visualization
- Model Accuracy
- Model Retraining
- Model Retiring
- Machine Learning in Action

Module 6. Model Metrics (29 min)

- Machine Learning Metrics
- Metrics for Supervised Learning
- Classification Model Metrics
- Normalized Discount Cumulative Gain (NDCG)
- Discount Cumulative Gain (DCG)
- Normalized Discount Cumulative Gain (NDCG) - Example
- Root Mean Squared Error
- Quantities of Error

Data Strategy for the Age of Big Data

Instructor: Asha Saxena Duration: 3 hours

We live in a Big Data world, yet most firms have not changed sufficiently to meet the challenges or reap the benefits of big data. Businesses need to understand that to be competitive they must use their big data assets to create effective new and improved products and services that give them the lead in their industry and their markets. They need to build data strategies that go beyond a set of rules and create a plan for winning in a competitive landscape. Big data strategy needs to transform your business model and your organization.

This course covers the core principles of building a big data strategy to generate the business value and deep insights that an organization needs to thrive in a competitive business environment.

You will learn:

- A framework to define and design big data strategy
- Concepts for alignment of business strategy and big data strategy
- Concepts and components of the Business Model Canvas
- How to apply Value Chain Analysis
- How big data creates opportunities for business transformation

This course is geared towards:

- Chief Data Officers
- Chief Analytics Officers
- VP, Director, Managers of Data and Analytics
- Data Architects
- Data Scientists

Course Outline

Module 0. About the Course (6 min)

Module 1. Overview and Framework of Data Strategy (69 min)

- o Overview of Data Strategy
- o Big Data
- What is Data Strategy
- Data Strategy and Data Governance Framework
- Components of Data Strategy
- Connecting Business and Technology
- Business Case Study
- o Business Model Innovation
- What is Innovation?
- Types of Innovation
- o Learn About Business Model

Module 2. Business Model Canvas and Business Strategy (24 min)

- Business Model
- Learn About Business Model
- Business Model Canvas
- Case Study: Uber
- Exercise 1
- Business Strategy
- o Summary

Module 3. Value Chain Analysis (29 min)

- Two Big Ideas in Strategy
- Executing Business Strategies Value Chain Analysis
- o Value-Chain Analysis: Michael Porter
- Value-Chain Michael Porter
- Resource-based Views of the Firm
- The Balance Scorecard
- Project Evaluation Criteria
- Measurable vs. Unmeasurable
- o Exercise 2
- o Summary

Module 4. Data Strategy (39 min)

- Data Strategy Part 1
- Characteristics of Data Strategy
- Data Strategy Framework
- Road Blocks
- Strategy and RoadMap
- Success Program and Optimizing Outcomes
- Module Summary

Module 5. Course Summary (12 min)

OUR INSTRUCTORS

Natasha Balac

Natasha Balac currently directs the Interdisciplinary Center for Data Science (ICData) at Calit2/Qualcomm Institute, and lectures in the area of big data and data science. She has led the Predictive Analytics Center of Excellence and collaborated on numerous government and research projects in the areas of analytics and visualization.

Deanne Larson

Dr. Larson is an active practitioner and academic focusing on business intelligence and data warehousing with over 20 years of experience. She completed her doctorate in information technology leadership. She PMP and CBIP certifications.

William McKnight

William is president of McKnight Consulting Group, which includes service lines of Master Data Management, IT assessment, Big Data, Columnar Databases, Data Warehousing, and Business Intelligence. He functions as Strategist, Lead Enterprise Information Architect, and Program Manager for sites worldwide.

Kevin Petrie

Kevin is Senior Director of Product Marketing at Attunity. He has written the book Streaming Change Data Capture: A Foundation for Modern Data Architectures and is a contributing writer for Eckerson Group. A frequent public speaker and accomplished writer, Kevin has nearly a decade of experience in data management and analytics.

Krish Krishnan

Krishnan is an international authority on unstructured data, social analytics and big data, text mining, and text analytics. An innovator and solution expert. he is recognized for his work in data warehouse architectures and is an acknowledged expert in performance tuning of complex database and data warehouse platforms.

Jennifer Leo

Dr. Jennifer Leo is the Director of The Steadward Centre for Personal & Physical Achievement at the University of Alberta, in Edmonton, Alberta, Canada. With over 15 years of experience conducting research and evaluation in community based settings, Jennifer brings insight into what it means to conduct research bevond academia.

Mark Peco

Mark Peco is an experienced consultant, educator, practitioner and manager in the fields of Business Intelligence and Process Improvement. He provides vision and leadership to projects operating and creating solutions at the intersection of Business and Technology.

Asha Saxena

Asha Saxena is a strategic, innovative leader with a proven track record of building successful tech businesses for the last 25 years. With a strong academic background, creative problemsolving skills, and an effective management style. She has been instrumental in building business models for success.

Dave Wells

Dave Wells is an educator, and industry analyst dedicated to building meaningful connections throughout the path from data to business value. He fills many roles including instructor and Education Director for eLearningCurve, Research Consultant at Eckerson Group, and faculty member at TDWI.

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- Enterprise customers typically Fortune 500 and Global 1000 companies
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WHAT OUR CUSTOMERS ARE SAYING...



-- Steve Lutter, CIMP Data Quality, DM and Metadata, IM Foundations, Business Intelligence, Data Governance, MDM, United States

It is evident that a thorough and considerable effort has gone into the preparation of this program.

-- Alfredo Parga O'Sullivan, CIMP Ex Data Quality, Ireland



The ability to take the courses at my own pace and at a time suitable for me was of great help.

-- Geeta Jegamathi, CIMP Data Quality, India

CONTACT US

Director, Enterprise Solutions Arkady Maydanchik Arkadym@elearningcurve.com

Director, Marketing Michelle Johnson Mjohnson@elearningcurve.com

Director, Education Dave Wells David.Wells@elearningcurve.com

Director, Technology Varya Belyaevskaya Admin@elearningcurve.com

Customer Support Support@elearningcurve.com

Phone: 1-630-242-1659 Mailing Address: 305 Midwest Club Parkway, Oak Brook, IL 60523



RESELLERS

DENMARK Right Training Contact: Jan Sørensen +45 31 45 04 99 jms@righttraining.dk

SOUTH AFRICA & SUB-SAHARAN AFRICA Master Data Contact: Gary Allemann +27 11 485 4856 gary@masterdata.co.za

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