



DATA ANALYTICS

Overview

Real-world data science is messy, and very different from reading or learning from a book. Having developed and deployed data analytics projects around the APAC region since 2012, we know this well. In our courses, we draw from our “battlefront” not only technical knowledge but lessons learnt to share with managers, data scientists and infrastructure engineers. We focus on telling it like it is, on showing what it really takes to deliver quality data science.

For Senior Executives

Understanding how data and machine learning is allowing organisations to understand customers and how the revival of artificial intelligence with techniques like deep learning are rapidly changing the competitive landscape and ecosystem is key to remaining relevant. Gain insights into how an organisation’s data can be managed and used by leveraging current best practices. During the programme, there will be opportunities to explore and discuss the myth and hype around big data, data analytics, machine learning and artificial intelligence.

For Managers

Our programmes balance the overview of the big data and machine learning landscape with an analysis of available industry tools, infrastructure, workflows and project management best practices. Learn how to scope, evaluate and manage big data and data science projects.

For Infrastructure Engineers

A data infrastructure engineer focuses on implementing the models fine-tuned by the data scientists, ensuring the infrastructure supports the data science workflow from ideation through to production. Learn how to build consistent and reproducible analytic environments and data processing platforms to support your data science teams.

For Analysts and Programmers

Data science should not be shrouded in mysterious mathematical equations; it is a practice which analysts should be able to apply to everyday work problems. Applicability and accessibility are crucial, so our programmes blend real-life examples with lessons on using flexible, powerful and popular tools such as Python and R. Learn not only strong fundamentals in data science programming, but also what translating your skills at the workplace really means.

Learning Journey



BUSINESS ANALYTICS

Executives /
Managers /
Consultants

Fundamentals	Intermediate	Advanced
Data Science & Artificial Intelligence for Senior Executives (0.5 day)		
Data Analytics Begins with Me (1 day)	Data Analytics for Managers (1 day)	Social Media and Sentiment Analysis Coming Soon (1 day)
Data Visualization Begins with Me (1 day)	Data-Driven Customer Experience (2 days)	
Customer Insights Begins with Me (1 day)	HR Analytics (2 days)	
Health Analytics for Allied Health Professionals/Managers (2 days)	Marketing Analytics (2 days)	



DATA SCIENCE & DATA ENGINEERING

Analysts /
Engineers /
Programmers

Fundamentals	Intermediate	Advanced
Chatbot Development Begins with Me (1 day)	Data Visualization in Python (1 day)	Capstone Project: Developing a Data Analytics Model (3 days)
	Python for Data Science (2 days)	
	R for Data Science (2 days)	
	Data Analytics and Visualization for IT Managers (3 days)	
	Data Analytics for Business Analysts (3 days)	

DATA SCIENCE AND ARTIFICIAL INTELLIGENCE FOR SENIOR EXECUTIVES

Data is the new oil. Understanding how data and machine learning is allowing organisations to understand customers and how the revival of artificial intelligence with techniques like deep learning are rapidly changing the competitive landscape and ecosystem is key to remaining relevant.

In this course, the instructors will share their experiences in building cloud, big data and analytics companies and projects over the last two decades.

You will gain insights into how an organisation's data can be ingested by leveraging current best practices and why leading data companies such as Google, Facebook are created and/or depending on open source tools such as Hadoop, Spark, R, and Python.

During the course, there will be opportunities to explore and discuss the myth and hype around big data, data analytics, machine learning and artificial intelligence.

Course Outline

- Overview of big data analytics, data science, machine learning and artificial intelligence
- The data analytics process, challenges applications
- Building your data analytics/science & engineering team

Course Details



* day 0.5
9.00am — 1.00pm

Who Should Attend

- CXOs
- Senior Managers
- Business Unit Heads

Pre-requisites

- None

Participants will learn

- Understand the current state of the art of big data infrastructure and analytics
- Be able to understand whether to buy or rent data infrastructure
- Take away a blueprint on how to build a data science team and project in order to pivot the company towards becoming a data-centric organisation

DATA ANALYTICS BEGINS WITH ME

Basic data analytics taught with a simple but powerful graphical user interface ("GUI") drag-and-drop tool targeted at working professionals requiring more sophisticated capabilities than what a spreadsheet can offer.

Understanding and using data is increasingly an important part of an executive function. Whether you are a business analyst, customer service officer, physiotherapist, procurement officer or HR executive – the ability to understand where potential data is coming from, and to properly collect it, clean it and then analyse the data will be an important and critical skill.

The course focuses on these core skills and provides you with the knowledge to participate in your organisation's data analytics process without any coding requirements.

Course Outline

- Overview of data science, machine learning & AI
- The data analytics stack
- Discussion of analytics use cases
- Hands-on: Introduction to the Orange data analytics toolkit

Course Details



1 day*
9.00am — 5.30pm

Who Should Attend

- Managers
- Executives
- Business Analysts
- Corporate Services Officers

Pre-requisites

Basic knowledge in Excel

Participants will learn

- Understand trends and development in data analytics and the analytics process
- Comprehend basic and advanced statistical concepts for analytics
- Appreciate data cleaning concepts & techniques
- Apply supervised learning concepts for predictive analytics in Orange

DATA VISUALISATION BEGINS WITH ME

Knowing how best to express your results from your data science and machine learning algorithms is key to convincing your team and management your point of view. The programme will provide an overview on visualisation and its principles.

Course Outline

- Introduction to data visualisation: design, tools & techniques
- Apply good design principles to basic visuals and interactive graphics
- Best practice for communicating with data visualisations
- Hands-on session on data visualisation

Course Details



1 day*
9.00am — 5.30pm

*Please visit scale.nus.edu.sg for course dates

Who Should Attend

- Managers
- Executives
- Business Analysts
- Corporate Services Officers

Pre-requisites

- Experienced with using Excel in manipulating data, charting and basis analysis.
- No programming experience required

Participants will learn

- Create visualisations and an interactive dashboard in QlikSense Desktop
- Apply best practices in data visualisation
- Craft a compelling story with data: data journalism
- Communicate story narrative effectively in QlikSense Desktop

CUSTOMER INSIGHTS BEGINS WITH ME

In the digital economy, where new media is becoming increasingly fragmented and consumers are being constantly inundated by information, meeting their expectations has never been more complex. Now, customers are making decisions quicker, and many companies find that they are unable to influence such decisions. The prime reason is simple: the transparency of the web has changed the business game forever. Customers are empowered and dictate what they want, when and where they want it. Following Google's philosophy - focus on the customer and all else will follow - many organisations are becoming more customer-centric.

Course Outline

STEP 1 - APPROACH

You will identify and define a business problem that can be solved by using external and internal customer data.

STEP 2 - CREATE

Guided by behavioural research, you will learn new ways to delve into the psyche of your customer.

STEP 3 - VALIDATE

You will see quick results of small-scale experiments and fine-tune your customer insights, to reduce business risks and uncertainties.

Course Details



1 day*
9.00am — 5.30pm

Who Should Attend

Professionals and managers who make strategic decisions on customer relationship management, customer service and customer experience design

Pre-requisites

- None

Participants will learn

- Appreciate the importance of customer insights and its impact on your customer strategy
- Apply appropriate methods and tools to understand, predict and influence customer behaviour

CHATBOT DEVELOPMENT BEGINS WITH ME

Chatbots on the mobile phone or web site are becoming a popular method to interact and service an organisation's customers. This 1-day course will enable you to build a basic Chatbot with no programming requirement. It is designed for organisations wanting to build and launch a Chatbot service on their web or as a mobile service.

Course Outline

- Introduction to bots and current landscape
- Overview of bots platforms & tools/frameworks
- Introduction to the Microsoft's QnA Maker tool
- Mini-challenge 1 – Build a FAQ knowledge base
- Introduction to the Microsoft Bot Framework
- Walkthrough of the Azure Bot Service
- Exploring and integration of selected bot channels (Skype, Webchat, Slack)
- Bot design best practices
- Mini-challenge 2 – Build and deploy your own Chatbot

Who Should Attend

- Data Analysts
- Programmers
- Frontline Staff
- Business Analysts
- Software Engineers
- Customer Service Officers

Course Details



1 day*
9.00am — 5.30pm

*Please visit scale.nus.edu.sg for course dates

Pre-requisites

- None

Participants will learn

- Understand the background of bot (Bots 101)
- Apply intelligence to bots
- Design bots using Q&A Maker and Microsoft Bot Framework

HEALTH ANALYTICS FOR ALLIED HEALTH PROFESSIONALS / MANAGERS

With the proliferation of healthcare data digitization, new techniques and approaches are needed for health care organizations to be able to leverage on the wealth of data they gather and generate to drive healthcare transformation and improve healthcare care delivery processes and outcomes.

In this two-day course, participants will gain insights to the changing landscape for healthcare delivery and the opportunities analytics bring to drive change and generate value. Participants will learn the fundamental concepts of health analytics and how to develop a health analytics strategy for the healthcare organisation or department. They will also learn how to develop and use effective indicators to access healthcare quality and value.

Course Outline

- To equip health professionals and managers with the fundamental concepts and knowledge of health analytics to be able to identify opportunities and incorporate analytics into their health practice to drive change and generate value.
- To expose and provide hands-on experience to health professionals and managers on how data analytic tools can be applied in healthcare settings.

Who Should Attend

Nurses, Nurse Managers, Allied Health Professionals and Managers, Pharmacists & Pharmacy managers, Doctors, Dentists

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Pre-requisites

Preferable at least a relevant degree in their field of work or 2 years relevant working experience in healthcare. Although some basic knowledge in statistics may be helpful, it is not necessary. Participants will be assumed to have no analytics/statistics/.programming background

Participants will learn

- Understand the changing landscape in healthcare and the analytics opportunities to drive change and value in healthcare
- Be able to describe and understand the fundamental concepts of health analytics
- Understand the various types of data analytics and their applications to healthcare delivery and processes.
- Be able to define and develop measures and indicators for assessing healthcare quality and value.
- Understand the key components of a health analytics framework and how to develop and implement the analytics strategy for healthcare organisations.
- Understand the key challenges and critical success factors for bringing health analytics to action and becoming an analytics healthcare organisation.

DATA ANALYTICS FOR MANAGERS

This course extends Data Analytics Begins with Me and dive into the use of data analytics to solve business problems, best practices in the set-up of a data analytics infrastructure, hiring and building a data science team, including data analytics. The course concludes with an extensive hands-on session on project scoping.

Course Outline

- Open source and analytics
- Data analytics infrastructure and tools
- The data science team
- Data analytics project management & set-up
- Hands-on: fraud detection & text analytics

Course Details



1 day*
9.00am — 5.30pm

Who Should Attend

- IT Managers
- Project Managers

Pre-requisites

The participant must have attended the day NUS SCALE Data Analytics Begins with-1 Me. In addition, the participant should have an IT/software project development, architecture or management experience. An understanding of common IT software, databases, programming tools and .environments is preferred

Participants will learn

- Appreciate the dynamics within a Data Science Team
- Understand the stages in an Analytics Projects
- Design and Define the scope of an Analytics Project
- Apply Supervised Learning Concepts for Credit Card Fraud Detection in Orange
- Learn and apply Text Analytics concepts for Survey Data in Orange

DATA VISUALIZATION IN PYTHON

Knowing how best to express your results from your data science and machine learning algorithms is key to convincing your team and management your point of view. This course will teach you visualization techniques using Python as part of your data science workflow. In this course, you will be shown how to leverage various Python libraries such as Matplotlib, Bokeh, Seaborn and others to enable you to focus on how to communicate with visualizations for maximum impact.

Course Outline

- Understanding Visualisation
- Interactive graphics
- Data munging – a prelude to visualisation
- Advanced data structures and visualisation

Course Details



1 day*
9.00am — 5.30pm

Who Should Attend

- Data Analysts
- Data Scientists
- Software Engineers

Pre-requisites

Must be familiar with the Python programming language and statistics 101 at a pre-university level

Participants will learn

- Understand principles of visual design
- Use basic interactive graphics
- Prepare Data for Visualisation: Data Munging – A Prelude to Visualisation
- Understand and apply advanced data structures and visualisation

DATA-DRIVEN CUSTOMER EXPERIENCE

A good customer experience drives customer retention, brand loyalty and revenue growth. There are many routes to improve your customer experience management, such as providing better customer service based on experience, as well as evidence from data. The old management adage tells us “you cannot manage what you do not measure”.

This 2-day course will enable you to take advantage of data analytics to understand what really matters to a customer. The tools metrics to assess customer touchpoints and data points against which you can track and analyse are included in the programme. This will demonstrate accountability and allow you to better understand, act on and align efforts in customer experience management.

Course Outline

- Why customer surveys often fail?
- What is customer journey analytics?
- How to capture and analyse voice of the customer?
- How to use data to confirm beliefs?
- What are improvement opportunities?

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Who Should Attend

Professionals and managers who are responsible for customer experience management

Pre-requisites

- Experience with customer experience management
- Basic understanding of data analytics

Participants will learn

- Use qualitative methods to map customer journey across key touchpoints
- Design and use survey questionnaire to measure customer experience
- Use contextual inquiry to measure online customer experience
- Use experiments to influence customer behaviour

MARKETING ANALYTICS

As part of any marketing plan, marketers must track, measure and predict the impact of all key marketing activities. The 2-day course will introduce techniques and metrics that will enable marketers to evaluate marketing initiatives by measuring performance. They will then be able to report on the past, analyse the present and predict the future.

Course Outline

- How to measure marketing activities
- How to justify marketing spending such as acquisition cost
- How to predict customer retention and customer churn
- How to improve the performance of targeted marketing

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Who Should Attend

- Data Analysts
- Marketing Practitioners

Pre-requisites

- Experience with marketing activities
- Basic understanding of data analytics

Participants will learn

- Understand of trends and development in marketing analytics
- Use supervised and unsupervised learning in customer acquisition; customer segmentation; customer churn detection; market basket analysis; marketing campaign analysis
- Apply open source tools (e.g. Orange, R) in marketing analytics

PYTHON FOR DATA SCIENCE

This course first introduces beginners to basic Python programming and community best practices such as using Jupyter/IPython. The course then moves on to show how Python can be applied to data mining, analytics, data science and artificial intelligence projects. At the end of this course, participants will gain an overview of the Python ecosystem as well as the skills necessary to self-learn and continue on their Python learning journey.

Course Outline

DAY 1

- Python Basics Part 1: Introducing Python environments, data structures and control flow
- Python Basics Part 2: Reading files into Python, Python modules, classes and code structure
- Working with data sources
- Making a data product

DAY 2

- Introduction to data exploration and wrangling with the Pandas library
- Introduction to data visualisation with the Matplotlib library
- Introduction to key data science and artificial Intelligence algorithms with the Scikit-Learn and Keras libraries

Who Should Attend

- Data Analysts
- Software Engineers
- Applied Statisticians

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Pre-requisites

- Basic scripting or programming experience in other languages is recommended.
- Familiarity with:
 - manipulating and graphing spreadsheet data
 - basic statistical concepts such as mean, standard deviation and confidence intervals
 - command-line shell such as bash/zsh or CMD/Powershell is recommended

Participants will learn

- Understand Python basics
- Explore and apply data from different sources
- Analyse data using Panda's library
- Design a basic data science project

R FOR DATA SCIENCE

R is the gold standard programming language today for data scientists. R provides a wealth of libraries for data manipulation, visualisation, and data modelling. R packages allows a beginner data scientist to build simple to sophisticated models quickly and easily in a few lines of code.

The course aims to quickly bring up to speed a programmer or business analyst who already knows how to programme in other languages or have done advanced Excel MACROS to begin using R as a data science tool.

In the course, we will define data science and explore the first two things a data scientist must do – cleaning and visualising data. We will learn and use R's dplyr, ggplot and ggvis packages for these tasks. We will move on to further steps in the Data Science Workflow - training models and testing them. We will do this by applying machine learning models to various industry-relevant data science problems. Our tool of choice will be the caret package. At the end of the programme, you should have a working knowledge of how to solve data science problems with R.

Course Outline

DAY 1

- Data cleaning and transformation: getting data into shape
- Data visualisation: mining for insights and telling a story
- R as a programming language

DAY 2

- Introduction to predictive modelling with R
- Communication and app development with Shiny apps

Who Should Attend

- Data Analysts
- Marketing Practioners

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Pre-requisites

Familiarity with a programming language such as Java, C/C++ or Python but NOT essential, and .statistics 101 at a pre-university level

Participants will learn

- Refresher: R programming & ecosystem
- Apply the analytics process framework in R
- Conduct descriptive analysis in R
- Apply data cleaning and transformation techniques in R: getting data into shape
- Build interactive web applications with Shiny R for visualisation
- Conduct supervised learning techniques with R's Caret Package and unsupervised learning techniques in R

HR ANALYTICS

An organization is only as good as the people who work for it. This course will focus on how to measure and improve the Human capital of an organization. Specifically, it will focus on using analytic techniques to support

- Attracting and recruiting the best staff?
- Retaining key people
- Determining how to improve people's engagement with and commitment to the organization

Analytic techniques will be used to assess how people have actually performed in the organization and relate this to attributes that can be measured and in many cases controlled. This two-day course will introduce techniques that enable HR staff to understand company staff performance in the present and be able to predict their future performance.

Course Outline

- How to use individual's attributes to predict their performance within the company
- How to determine how long an individual will remain in an organization
- How to quantify an individual's contribution to an organization
- What factors will increase an individual's contribution to an organization
- What the impact of organizational initiatives (such as team-building) have on an individual's engagement/commitment to an organization

Course Details



2 days*
9.00am — 5.30pm
(Daily)

Who Should Attend

HR Analysts, Recruitment Managers, Training Managers

Pre-requisites

- Experience with HR activities
- Basic understanding of data analytics

Participants will learn

- Understand what are the important HR metrics
- Measure and improve your major HR activities (such as recruitment, personal development etc.)
- Optimise the use of your employee's capabilities in achieving organisational goals

DATA ANALYTICS FOR BUSINESS ANALYSTS

Business analysts who analyse an organisation's business domain and document its business processes or systems, assessing the business model or its integration with technology. As a bridge between the business problems and the technology solutions, business analysts need to understand an organisation's data requirements, and execute its data strategy.

This course aims to help Business Analysis managers and professionals perform better in their job roles, including appreciation of data science, understanding data analytics stack and its application, managing data analytics projects and helping users discover and scope data requirements and problems.

Course Outline

- Advancing Data Analytics at Organisations
- Managing Data Analytics Projects
- Assisting users to discover and sharpen Data Science problem statements
- Masking and anonymisation, SQL statements to extract, data transformation

Course Details



2.5 days*
9.00am — 5.30pm
(Daily)

Who Should Attend

Data Analytics for Business Analysts

Pre-requisites

Participants should have enterprise Business Analysis knowledge, some project management and basic statistics experience

Participants will learn

- Gain a broad understanding of data science infrastructure, data analytics stack, and deployment best practices
- Manage data analytics projects and help users discover and scope data requirements and problems

DATA ANALYTICS AND VISUALIZATION FOR IT MANAGERS

IT managers and professionals who are managing information technology and computer systems in their organizations have to play the lead role in shaping the direction and planning the strategies on data infrastructure, platform, process and operations.

This programme aims to help IT managers and professionals make better decisions, including understanding data infrastructure and platform, data science techniques and tools, and data analytics project management, and subsequently optimizing resources to achieve the best results.

Course Outline

- Overview of Big Data, Data Analytics / Science, Machine Learning, and Artificial Intelligence
- The Data Analytics Process
- Data Analytics Methods, Challenges and Applications
- Data Analytics Infrastructure and Tools
- Project Management Best Practices for Data Analytics

Course Details



3 days*
9.00am — 5.30pm
(Daily)

Who Should Attend

IT Managers and Engineers

Pre-requisites

Participants should have enterprise IT knowledge, some programming and basic statistics experience

Participants will learn

- Understand data infrastructure and platform, data science techniques and tools, and data analytics project management, and subsequently optimizing resources to achieve the best results
- Gain a broad understanding of big data, data science, machine learning, artificial intelligence and data science infrastructure and tools

CAPSTONE PROJECT: DEVELOPING A DATA ANALYTICS MODEL

Data Analytics Capstone adopts a blended learning approach, allowing participants to use what they have learned about data analytics to carry out a mini project.

This course aims to help participants apply data analytics knowledge and skills to understand and solve business problems, prepare and analyse data, communicate results, and subsequently create business values for their organisations.

Course Outline

- Create a detailed problem statement to address real-world business problems
- Use appropriate data and the technical skills they have/will learn to solve such problems
- Use data visualisation to communicate the deliverables

Course Details



3 days*
9.00am — 5.30pm
(Daily)

Pre-requisites

Participants should have enterprise Business Analysis knowledge, some project management and basic statistics experience

Who Should Attend

Managers and Engineers in the ICT sector

Participants will learn

- Apply data analytics knowledge and skills to understand and solve business problems
- Prepare and analyse data, communicate results, and subsequently create business values for their organisations

