

# Connect Intensive - Business Analyst Syllabus

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## Contact Info

While going through the program, if you have questions about anything, you can reach us at . For help from Udacity Mentors and your peers visit the Udacity Classroom.

## Nanodegree Program Info

**Version:** 1.0.0

**Length of Program:** 126 Days\*

*\* This is a self-paced program and the length is an estimation of total hours the average student may take to complete all required coursework, including lecture and project time. Actual hours may vary.*

## Part 1: Problem Solving with Analytics

Learn a structured framework for solving problems with advanced analytics. Learn to select the most appropriate analytical methodology. Learn linear regression.

### Project: Predicting Diamond Prices

Use a predictive model to predict the prices for a large set of diamonds and provide a recommendation for a bid price.

### Supporting Lessons

Lesson	Summary
Orientation	Learn about how Udacity Nanodegree programs work, as well as get a few tips on how to successfully complete the program. Hear more about what you'll learn and do during this Nanodegree program.

### Project: Predicting Catalog Demand

A home-goods manufacturer wants to predict expected profits from a catalog launch. You will apply a

framework to work through the problem and build a linear regression model to provide results and a recommendation.

### Supporting Lessons

Lesson	Summary
<b>The Analytical Problem Solving Framework</b>	Learn a structured framework for solving problems with advanced analytics.
<b>Selecting an Analytical Methodology</b>	Select the most appropriate analytical methodology based on the context of the business problem.
<b>Linear Regression</b>	Build, validate, and apply linear regression models to solve a business problem
<b>Practice Project</b>	Get hands on practice building a linear regression model.

## Part 2: Data Wrangling

Understand the most common data types. Understand the various sources of data. Make adjustments to dirty data to prepare a dataset. Identify and adjust for outliers. Learn to write queries to extract and analyze data from a relational database.

### Project: Create an Analytical Dataset

A pet store chain is selecting the location for its next store. You will use data preparation techniques to build a robust analytic dataset, then build a predictive model to select the best location.

### Supporting Lessons

Lesson	Summary
<b>Understanding Data</b>	Understand the most common data types. Understand the various sources of data.
<b>Data Issues</b>	Identify common types of dirty data. Make adjustments to dirty data to prepare a dataset. Identify and adjust for outliers.
<b>Data Formatting</b>	Summarize, cross-tabulate, transpose, and reformat data to prepare a dataset for analysis.
<b>Data Blending</b>	Join and union data from different sources and formats.
<b>Practice Project</b>	Get hands on practice cleaning, blending, and preparing a dataset.

### Project: Create Reports from a Database

Management wants some high level metrics about their organization. You will write SQL queries to extract and analyze data from a transactions database and prepare a set of visualizations.

## Supporting Lessons

Lesson	Summary
<b>Basic SQL</b>	In this section, you will gain knowledge about SQL basics for working with a single table. You will learn the key commands to filter a table in many different ways.
<b>SQL Joins</b>	In this lesson, you will learn how to combine data from multiple tables together.
<b>SQL Aggregations</b>	In this lesson, you will learn how to aggregate data using SQL functions like SUM, AVG, and COUNT. Additionally, CASE, HAVING, and DATE functions provide you an incredible problem solving toolkit.
<b>SQL Subqueries &amp; Temporary Tables</b>	In this lesson, you will be learning to answer much more complex business questions using nested querying methods - also known as subqueries.
<b>SQL Data Cleaning</b>	Cleaning data is an important part of the data analysis process. You will be learning how to perform data cleaning using SQL in this lesson.
<b>[Advanced] SQL Window Functions</b>	Compare one row to another without doing any joins using one of the most powerful concepts in SQL data analysis: window functions.
<b>[Advanced] SQL Advanced JOINS &amp; Performance Tuning</b>	Learn advanced joins and how to make queries that run quickly across giant datasets. Most of the examples in the lesson involve edge cases, some of which come up in interviews.

## Part 3: Data Visualization

Understand the importance of data visualization. Know how different data types are encoded in visualizations. Select the most effective chart or graph based on the data being displayed.

### Project: Visualize Movie Data

You will explore a dataset of movies and build Tableau dashboards to answer a set of questions and tell a story with data.

## Supporting Lessons

Lesson	Summary
<b>Intro to Data Visualization</b>	In this lesson, you will get a glimpse at different data visualizations and when they are used.
<b>Design</b>	In this lesson, you will learn about visual encodings, and best practices for building data visualizations.
<b>Data Visualizations in Tableau</b>	In this lesson, you will learn how to make visualizations in Tableau. Get excited - it is about to get awesome!
<b>Making Dashboards &amp; Stories in Tableau</b>	In this lesson, you will learn from a Tableau expert, and start putting together your own dashboards and stories.

## Part 4: Classification Models

You will use classification models, such as logistic regression, decision tree, forest, and boosted, to make predictions of binary and non-binary outcomes.

### Project: Predicting Default Risk

A bank recently received an influx of loan applications. You will build and apply a classification model to provide a recommendation on which loan applicants the bank should lend to.

### Supporting Lessons

Lesson	Summary
<b>Classification Problems</b>	Understand the fundamentals of classification modeling and how it differs from modeling numeric data
<b>Binary Classification Models</b>	Build logistic regression and decision tree models. Use stepwise to automate predictor variables selection. Score and compare models and interpret the results.
<b>Non-Binary Classification Models</b>	Build and compare forest and boosted models and interpret their results. Score and compare models and interpret the results.

## Part 5: A/B Testing

Understand the fundamentals of A/B testing, including experimental design, variable selection, and analyzing and interpreting results.

### Project: A/B Test a New Menu Launch

A chain of coffee shops is considering launching a new menu. You will design and analyze an A/B test and

write up a recommendation on whether the chain should introduce the new menu.

## Supporting Lessons

Lesson	Summary
<b>A/B Testing Fundamentals</b>	Understand the fundamentals of A/B testing, including selecting target and control units and variables and the duration of a test.
<b>Randomized Design Tests</b>	Select test and control variables and understand the importance of sample size. Design a randomized design A/B test and analyze the results.
<b>Matched Pair Design Tests</b>	Match test units to control units. Design a matched pair design A/B test and analyze the results.
<b>Matched Pair Practice</b>	Use trend and seasonality as control variables for a matched pair design A/B test.

## Part 6: Time Series Forecasting

Understand trend, seasonal, and cyclical behavior of time series data. Use time series decomposition plots. Build ETS and ARIMA models.

### Project: Forecast Video Game Demand

A video game producer is planning production levels. You will use time series forecasting models to forecast monthly demand and provide a recommendation to help match supply to demand.

## Supporting Lessons

## Lesson

## Summary

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### Fundamentals of Time Series Forecasting

In this lesson you'll learn what attributes make data a time series. You'll also learn the key components used in time series forecasting, such as seasonality, trends, and cyclical patterns.

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### ETS Models

In this lesson you'll learn how to build and use ETS models. ETS stands for error, trend, and seasonality, and are the three inputs in ETS models. You'll learn how to use time series decomposition plots to visualize each of these components. Then you'll get hands on practice building out an ETS model in Alteryx.

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### ARIMA Models

In this lesson you'll learn how to build and use ARIMA models. ARIMA stands for autoregressive, integrated, moving average, which are the inputs for ARIMA models. You'll learn how to stationarize data through differencing, a process that prepares data for ARIMA modeling. You'll learn the different techniques used in seasonal vs. non-seasonal data. Then you'll get hands on practice building out an ARIMA model in Alteryx.

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### Analyzing and Visualizing Results

This lesson will demonstrate how to interpret the various results from time series model. You'll learn how to use holdout samples to compare models and select the best one for a business problem. You'll also learn how to visualize your forecasts through various plots.

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## Part 7: Segmentation and Clustering

Understand the difference between localization, standardization, and segmentation. Scale data to prepare a dataset for cluster modeling. Use principal components analysis (PCA) to reduce the number of variables for cluster model. Build and apply a k-centroid cluster model. Visualize and communicate the results of a cluster model. Then complete a capstone project combining techniques learned throughout the program.

### Project: Combining Predictive Techniques

A grocery store chain is planning a significant expansion. You will use multiple analytical techniques to provide recommendations on how to expand. After completing the project, you will feel comfortable combining predictive techniques and delivering results to complex business problems.



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