

BI 348 Syllabus Table of Contents

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Full Course Name

BI 348: Big Data Business Analytics with Microsoft Power Tools

Prerequisites for BI 348:

Busn 216, Busn 218, Busn 210

Catalog Description

We will use Microsoft's new Power Tools (Excel Power Pivot, Power Query and Power BI Desktop) to convert real world large data sets into useful information for business decision making. In addition to learning the standard features in the various tools, we will learn, in depth, how to use the computer languages DAX and M Code to transform data, load data, and convert the loaded data into useful information for reporting, visualizing, analytics and dashboarding. An emphasis is placed on real world situations where data comes from varying and disparate sources and is often not in the proper form for data analysis; said a different way: we get our hands dirty with the art of converting bad data into useful data, and then into useful information.

Getting Started in this Class:

- 1) The first thing you must do is watch the Class Introductory Video and read the Syllabus at this web site: <https://people.highline.edu/mgirvin/AllClasses/348/MSPTDA/348/MSPTDAWebPage.htm>
- 2) The video and written syllabus show how this "No Textbook"-YouTube class will be conducted.

Student Learning Outcomes (SLO), Measured By College Wide Outcomes (CWO)

1. SLO: Convert unorganized raw big data sets into useful information (reports, visualizations and analytics) for business decision making, providing data driven insights.
 - CWO:
 - i. Think critically
 - ii. Reason quantitatively
 - iii. Information/visual literacy
2. SLO: Become proficient with the analysis and visualization tools Excel Power Pivot, Power Query and Power BI Desktop, and with the computer languages DAX and M Code.
 - CWO:
 - i. Think critically
 - ii. Reason quantitatively
 - iii. Information/visual literacy
3. SLO: Extract, transform and load data (ETL) to create efficient and effective data models and business-related measures needed to build refreshable useful information solutions.
 - CWO:
 - i. Think critically
 - ii. Reason quantitatively
4. SLO: Efficiently and effectively construct information solutions such as reports, visualizations and dashboards for business decision makers.
 - CWO:
 - i. Think critically
 - ii. Reason quantitatively
 - iii. Information/visual literacy
5. SLO: Create Excel worksheet formula solutions for linear programming, simulations and other analytic goals.
 - CWO:
 - i. Think critically
 - ii. Reason quantitatively

Course Outline

1. Overview of all tools and concepts in the class.
2. Define Data Analysis and Business Intelligence.
3. Define Data Analysis, Business Intelligence and Data Warehousing Terms and concepts.
4. Use Excel Spreadsheet Formulas and Functions for creating information solutions.
5. Use Standard PivotTables for creating information solutions.
6. Use Power Query to extract, transform and load data to an Excel Worksheet, a PowerPivot Data Model or a Power BI Desktop Data Model.
7. Learn to write M Code (Code behind Power Query's User Interface) to extract, transform and load data.
8. Use Power Query, M Code and DAX to build efficient and effective Data Models for both Excel Power Pivot and Power BI Desktop.
9. Use Excel Power Pivot for creating information solutions.
10. Use Power BI Desktop for creating information solutions.
11. Learn about how the Columnar Database compacts and stores data for a Data Model.
12. Learn to write basic to advanced DAX code to create business calculations using calculated columns, queries and measures.
13. Build efficient and effective dashboards that contain refreshable and sharable reports, visualizations and analytics.
14. Build efficient and effective Data Analysis and Business Intelligence solutions from beginning to end using case studies.

Requirements for class:

- 1) You must be using a Windows Based PC computer, not a Mac (the programs we are using do not exist on a Mac).
- 2) Using your student credentials (e-mail and password), you must contact Build 30 Help Desk to download the free "Office 365" package of programs from Microsoft.
- 3) Download the Program Power BI Desktop. Video # MSPTDA #16 shows how.
- 4) Using your student credentials (e-mail and password), log in to Power BI Online. Video # MSPTDA #17 shows how.
- 5) There is no textbook to buy for this class.
- 6) Buy a USB drive so you can store your system of folders and about class generated files.

Access to Computers:

- 1) If you do not have daily access to a PC computer with Excel, Highline provides computers for you to use in building 30.
- 2) During the Covid19 Event, Build 30 may be closed down.
- 3) If you do not have access to computers, the options are:
 1. Apply for technology resources. Here is what Dr. Mosby's, the president of our college, has said:
 - i. With the decision to extend online and remote teaching and online student services for the entire spring quarter, we recognize that some students are in need of technology resources to be successful. Highline will be able to provide some limited resources (such as Chromebooks and Wi-Fi hotspots) so that students can participate in online learning. The Technology Resource Loan Program will allow students to request technology support for spring quarter. Depending on demand, there may be a random lottery selection due to the limited supplies on hand. If you would like to be entered in the selection pool for these resources, fill out the [Student Technology Resource Loan Request](#)
 - ii. Link to Student Technology Resource Loan Request:
https://docs.google.com/forms/d/e/1FAIpQLSe505SSRDCLADPz0QPCFZhyC76IYbqc0JI6sTRJ_bu7DXiPfg/viewform
 2. Take this class in a different quarter.

We have Two Class Web Sites:

1. Use the people.highline web site to download files and watch videos:

<https://people.highline.edu/mgirvin/AllClasses/348/MSPTDA/348/MSPTDAWebPage.htm>

The people site contains:

- 1) Introductory Video
- 2) Syllabus, which has details of the class and a daily schedule with details of video lectures, quizzes and test dates and times.
- 3) All Video Lectures
- 4) Downloadable files for class

2. Use Canvas to post questions in the Discussions area, take quizzes, upload tests & view your points for the class.

<https://canvas.highline.edu>

The Canvas site contains:

- 1) Announcements
- 2) Discussions area for asking questions
- 3) Quizzes
- 4) Project Upload Links
- 5) Grades section shows you your points earned for the quizzes and tests
- 6) The Canvas site is only available during Spring quarter which starts Monday April 6, 2020 and ends at Noon Wed, June 10, 2020. This means that the Canvas web site will not be available after the end of the class at Noon Wed, June 10, 2020.

Structure of class:

- 1) There is no textbook for this class.
- 2) You will learn from:
 1. Watching YouTube Videos and studying and practicing what you see in the video.
 2. Reading and studying the pdf notes, which summarize in written and pictorial form what you see in the video.
 3. Completing the homework problems for each video as practice.
- 3) You will earn points toward your grade from:
 1. Completing and uploading to Canvas "Points Projects" at the end of each week.
 2. Completing True/FALSE, Multiple Choice Canvas Quiz at the end of each week.
- 4) This is a hybrid class where you can choose to come to class or study on your own at home.
 1. In-Class Version:
 - i. The in-class session will be an open lab, where the instructor will be present to help you work on non-graded assignments and issues with graded assignments like text files not loading to data model correctly.
 - ii. You will watch and study the videos, pdf note and practice homework problems at home and then come in with questions you would like answered.
 2. On-line Version:
 - i. You follow along with schedule listed at the end of this syllabus.

Quizzes:

1. There will be about eight (8) Canvas True/False or Multiple Choice.
2. The quizzes will be posted to the Home area of Canvas.
3. The quizzes are numbered #3 to #11.
4. Each quiz will be cumulative, which means it will test on everything in the class up to that point in the class. During the quiz, there is no backtracking, which means you must be sure of your answer before submitting it.
5. The suggested dates for the quizzes are listed in the schedule at the end of this syllabus. However, the quizzes can be taken anytime during the quarter, but it is strongly suggested that you take them as close to the dates as they are listed in the schedule.
6. The quiz scores earned will count toward your grade for the class.

Points Projects:

1. There will be about eight (8) Points Projects that you can hand in for points toward a grade.
2. A Zipped Folder with the Points Projects can be downloaded from our people web site in a link below the weeks content.
3. The Points Projects are numbered #3 to #11.
4. The Points Projects will ask you to complete a Data Analysis Task, similar to what you have learned from the class.
5. Points Projects must be handed in by the due date as listed in the schedule at the end of this syllabus.
6. The Points Projects scores earned will count toward your grade for the class.
7. Complete the Points Projects and use the upload link in the Home area of Canvas to upload your finished project.
8. The Points Projects file name must have your name in the file name or you get zero points. If you are doing Points Projects 01 and your name is Sioux Chin, the file name must be something like this: "SiouxChinPointsProjects 01.xlsm".
9. You can hand in Points Projects late if a documentable emergency occurs, like documented deaths or medical emergencies.
10. Late Points Projects without a documentable emergency earn a 25% deduction.
11. Points Projects are due at midnight on the date listed in the schedule.

Canvas Gradebook is NOT Correct

- 1) Do NOT use the percentage grades you see in canvas to calculate your grade.
- 2) The percentage grades you see in canvas indicate the percentage correct, ONLY on assignments handed in.
- 3) The scores for each assignment in Canvas are correct. That is to say, the point you earned are correct.
- 4) All official grading for your grade will be done outside of Canvas. Grades will be calculated in Excel by the instructor.

6) Grading Scale:

Grading:

- 1) Your grade is calculated by tallying your total points from tests and quizzes and dividing by the total points possible from tests and quizzes. That decimal or percentage can be looked up in the table at the right to determine your grade.
- 2) For example if you got 21 out of 30 in quiz 1 and 24 out of 30 on quiz 2 and 84 out of 100 on Test 1, your total points would equal 129 (21+24+84), the total possible would be 160, and your percentage of points earned would be: $129/160 = 0.81$ or if you format it with a percentage: 81% and your decimal from the table on the right would be 2.7.

% Grade	Decimal Grade
94.00%	4
93.00%	3.9
92.00%	3.8
91.00%	3.7
90.00%	3.6
89.00%	3.5
88.00%	3.4
87.00%	3.3
86.00%	3.2
85.00%	3.1
84.00%	3
83.00%	2.9
82.00%	2.8
81.00%	2.7
80.00%	2.6
79.00%	2.5
78.00%	2.4
77.00%	2.3
76.00%	2.2
75.00%	2.1
74.00%	2
73.00%	1.9
72.00%	1.8
71.00%	1.7
70.00%	1.6
69.00%	1.5
68.00%	1.4
67.00%	1.3
66.00%	1.2
65.00%	1.1
64.00%	1
63.00%	0.9
62.00%	0.8
61.00%	0.7
0.00%	0

Effective and Efficient Solutions:

- 1) Grading is based on whether or not a solution to a problem is Effective and Efficient.
- 2) Define Effective = Accomplish the stated goal.
- 3) Examples of Effective:
 1. The calculations in the Data Model PivotTable calculates the correct answer, rather than the incorrect answer.
 2. A transformation of text data correctly transforms the data into a Proper Data Set, rather than to an Improper Data Set.
- 4) Define Efficient = Accomplish the goal with the minimum number of resources and have the accomplished goal have the ability to adapt to future changes.
- 5) Examples of Efficient:
 1. Loading 500,000 rows of data to the Power Pivot Data Model which results in a small file size, rather than loading it to an Excel Worksheet which results in a larger file size.
 2. Using "From Folder" feature in Power Query as a Data Connector, which allows future data source files to be easily incorporated into existing reports, rather than manually adding the future data source files.

Cheating:

- 1) Cheating will result in the student receiving a failing grade for the assignment.
- 2) Turning in an item you did not create is cheating.
- 3) Copying another person's digital item or work is cheating.
- 4) Allowing (intended or not intended) someone else to copy your work or digital item, is considered cheating and will result in a failing grade for the assignment. This means that you must safeguard your work and computer so that others do not have access to your work or computer.
- 5) During a test, quiz or project, do your own work, do not look at other's work, and do not talk with others (to do so is cheating).
- 6) Having someone take or help you with a test or quiz or project is cheating.
- 7) In accordance with the student's rights and responsibility code WAC 1321-120 <http://www.highline.edu/stuserv/vpstudents/srr.html>, the instructor has the obligation to report incidents of cheating

Incomplete Policy

- 1) In accordance with Highline policy, Incomplete Contacts are granted in the cases of documented emergencies. Examples of documentable emergencies are notes from doctor for hospital visit or a copy of death certificates for a relative.
- 2) Incompletes are considered only if 80% of the class work is done with a 2.0 grade or higher before the end of the ninth week.
- 3) The student must notify the instructor BEFORE the last day of the class in order to qualify for an incomplete.
- 4) If an incomplete is granted, a contract between the student and teacher will be created and the terms of the contact will be submitted to Registration.

Access Services

Highline Community College offers support services for students with disabilities to ensure access to programs and facilities. If you have questions or comments about Access Services, please contact us at 206-878-3710x 3857 or access@highline.edu. Access Services is located in Building 99 Rooms 150-185

Last Day of Class:

- All tests, projects and quizzes must be completed before the final day of class: **noon Wed, June 10, 2020.**
- The Canvas web site will be shut off after the final day of class: **noon Wed, June 10, 2020.**
- If you want to contact the instructor after the class is over, you can e-mail Michael Girvin at: mgirvin@highline.edu

E-mailing is for Personal Issues & Points Projects or Quiz Questions:

You cannot e-mail the instructor except when you have a personal matter to discuss or you have a question about a quiz or Points Projects. All other questions about BI 348 are done in the Discussions area of Canvas.

All e-mails with questions about tests/quizzes or personal matters must:

- 1) Include a subject line that includes the text "BI 348"
- 2) Must be spell and grammar checked
- 3) Must be signed with the student's name
- 4) Must be from your highline student e-mail address (FERPA Federal Law requires this)

Announcements & Discussions In Canvas

The teacher will communicate with you through Announcements in Canvas and by answering your questions in the Discussions area of Canvas.

When you post a question in Canvas:

- 1) Spell and grammar check your post.
- 2) Do not post questions about tests or quizzes in the Discussion area. The proper place to send questions about tests or quizzes is to send the teacher an e-mail.
- 3) Attach your file (like Excel or Power BI) which has the issue.

Instructor Contact Information:

Spring 2020					
Michael Girvin					
Email: mgirvin@highline.edu					
Class Web Site: https://people.highline.edu/mgirvin/					
Class Schedule					
Item	Course No.	Days	Time	Location	End Of Class Date-Time
2026	Busn 135	Online	Online	Online	Tue, Jun 9, 2020, noon
2024	Busn 135	Online	Online	Online	Tue, Jun 9, 2020, noon
2072	Busn 218	Online	Online	Online	Wed, Jun 10, 2020, noon
2068	Busn 210	Online	Online	Online	Wed, Jun 10, 2020, noon
2001	BI 348	Online	Online	Online	Wed, Jun 10, 2020, noon
	Office Hours	e-mail M-F, 9AM-5PM	e-mail M-F, 9AM-5PM	Online	E-mail mgirvin@highline.edu

Schedule

Week	Topic	Video Number	Video Time (H:MM:SS)	Video Title	Canvas Quiz Due Date	Points Project Due Date
Week 1: Mon, 4/6/20 to Sun, 4/12/20	Intro to Business Intelligence & Power Query	MSPTDA 1	0:12:12	MSPTDA Class Introduction	Quiz 3: due before midnight Sun, 4/12/20	Points Project 3: due before midnight Sun, 4/12/20
		MSPTDA 2	0:31:25	Data Analysis and Business Intelligence Terms		
		MSPTDA 3	0:57:12	Power Query Introduction: Excel & Power BI Desktop		
		MSPTDA 4	0:32:02	Power Query: Import Multiple Excel Files & Combine (Append)		
		MSPTDA 5	0:27:44	Power Query: Append All Excel Tables in Excel Workbook		
		MSPTDA 6	0:23:38	Power Query: Merge, Append, & UnPivot		
Week 2: Mon, 4/13/20 to Sun, 4/19/20	Power Query and M Code	MSPTDA 7	0:37:38	Power Query Types of Joins, 6 Types of Merges	Quiz 4: due before midnight Sun, 4/19/20	Points Project 4: due before midnight Sun, 4/19/20
		MSPTDA 8	0:30:42	Power Query Group By feature & Table.Group Function		
		MSPTDA 8.5	0:07:18	Power Query Group By Unique List or Consecutive Occurrences		
		MSPTDA 11	0:19:00	Power Query Import from SQL Server Database. Excel & Power BI Desktop		
		MSPTDA 11.5	0:03:00	Which PQ Steps Are Used in SQL Query Folding? "View Native Query"!		
Week 3: Mon, 4/20/20 to Sun, 4/26/20	Power Query and M Code	MSPTDA 9	1:07:26	Complete M Code Introduction: Values, let, Lookup, Functions, Parameters, More	Quiz 5: due before midnight Sun, 4/26/20	Points Project 5: due before midnight Sun, 4/26/20
		MSPTDA 9.5	0:05:21	Formula.Firewall Error in Power Query: Rebuild This Data Combination Solved		
		MSPTDA 10	0:29:39	M Code for Moving Annual Total (MAT): Power Query Custom Function / Column		
		MSPTDA 12	0:20:00	Using Locale in Power Query: Import & Append Text Files from Different Countries		
Week 4: Mon, 4/27/20 to Sun, 5/3/20	Power Pivot	MSPTDA 13	0:15:23	Power Pivot Intro 1: Relationships rather than VLOOKUP for PivotTable Report	Quiz 6: due before midnight Sun, 5/3/20	Points Project 6: due before midnight Sun, 5/3/20
		MSPTDA 14	0:19:00	Power Pivot Intro #2: Amazing Columnar Database for Importing Millions Rows Data		
		MSPTDA 15	2:05:00	Comprehensive Introduction to Excel Power Pivot, DAX Formulas and DAX Functions		
Week 5: Mon, 5/4/20 to Sun, 5/10/20	Power BI	MSPTDA 16	0:01:19	Power BI Desktop Comprehensive Introduction: PQ, DAX, Dashboards, Publishing	Quiz 7: due before midnight Sun, 5/10/20	Points Project 7: due before midnight Sun, 5/10/20
		MSPTDA 17	0:08:30	Power BI Online: Dashboards, Reports, Excel Workbooks, Data Sets		

Week	Topic	Video Number	Video Time	Video Title	Canvas Quiz Due Date	Points Project Due Date
Week 6: Mon, 5/11/20 to Sun, 5/17/20	DAX	MSPTDA 18	1:07:00	DAX Iterators, Table Functions, Grain, Cardinality, Materializing Tables	Quiz 8: due before midnight Sun, 5/17/20	Points Project 8: due before midnight Sun, 5/17/20
		MSPTDA 19	1:48:00	CALCULATE DAX Function & Filter Context & ALLSELECTED & KEEPFILTERS		
Week 7: Mon, 5/18/20 to Sun, 5/24/20	Data Modeling	MSPTDA 20	0:11:06	Data Source Folder Path Query Parameter to create Dynamic Folder Location	Quiz 9: due before midnight Sun, 5/24/20	Points Project 9: due before midnight Sun, 5/24/20
		MSPTDA 21	0:25:12	Power Query: Reduce Data Model Size, Transformations to Columnar Database Size		
		MSPTDA 22	0:20:07	DAX Data Modeling for Date & Time Dimension Tables, Word Cloud Visual		
Week 8: Mon, 5/25/20 to Sun, 5/31/20	Data Modeling	MSPTDA 23	1:04:00	Two Fact Tables into One Fact Table	Quiz 10: due before midnight Sun, 5/31/20	Points Project 10: due before midnight Sun, 5/31/20
		MSPTDA 24	0:06:50	Data Types & Math		
		MSPTDA 25	0:06:16	Budget Vs Actuals with Excel Worksheet Formulas		
		MSPTDA 26	0:10:51	Budget Vs Actuals with Data Modeling and DAX Measures		
Week 9: Mon, 6/1/20 to Sun, 6/7/20	Data Modeling	MSPTDA 27	0:13:39	SUMPRODUCT & SUMIFS Worksheet Array Formula to Add Units in Many To Many Relationships	No Quiz	Points Project 11: due before midnight Sun, 6/7/20
		MSPTDA 28	0:17:28	Build Power Query Bridge Table in Power BI & Power Pivot for Many To Many Relationship		
		MSPTDA 29	0:10:20	Order & Ship Date in Fact Table? Side-By-Side & Cross Tab Reports with Worksheet Formulas		
		MSPTDA 30	0:10:19	Order & Ship Dates in Fact Table: DAX Formulas and Data Modeling to Create Reports		
		MSPTDA 36	0:13:22	How To Build Sample File Parameter For A Custom Function to Transform 12 Cross Tab Tables		
Week 10: Mon, 6/8/20 to Wed, 6/10/20	<p>Finals Week. No New Content. All Work Must Be Submitted before noon Wednesday, 06/10/2020</p>					