SYLLABUS
BIG DATA ANALYTICS USING EXCEL BUSINESS INTELLIGENCE AND POWER BI TOOLS (ECTS 5)

The mission of ZSEM is to transfer values, knowledge, and skills that students need for long-term success in a globalized business world undergoing constant technological and market transformations.

LECTURERS
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Office hours  
BA

Discussion:  On Loomen
Most questions are not of private nature so please use Loomen discussion for communication so other students can also benefit from answered questions.

COURSE SCHEDULE

<table>
<thead>
<tr>
<th></th>
<th>Hours</th>
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<tbody>
<tr>
<td>Lectures</td>
<td>12 hours (6 x 2 hrs)</td>
</tr>
<tr>
<td>Computer practice</td>
<td>30 hours</td>
</tr>
<tr>
<td>Project presentations</td>
<td>3 hours</td>
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<tr>
<td>FINAL</td>
<td>45 hours</td>
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</tbody>
</table>

COURSE DESCRIPTION

Presents candidates to Explore their data in new ways with interactive dashboards in Power BI, IBM Watson Analytics and Tableau tools.

This smarter solution for data analytics, providing automated discovery and visualization features that you can't find anywhere else. Learn how to use this powerful yet easy-to-use cloud-based tool for data science and business analytics. Discover how to import and refine data from local or cloud-based sources.

Build new calculations, hierarchies, and data groups on the fly and leverage cognitive starting points, natural language queries, and dynamic insights.

Learn how to create and share visualizations, dashboards, and infographics to bring your insights to life.
Completion of this course will enable candidates to create Dashboards act like dynamic reports that can be used for in-depth data analysis or to present information to professors and clients. He shows how to build and format the worksheets that will feed your dashboard, design the dashboard itself, and add interactive parameters that allow users to customize the display. Along the way, candidates learn how to use some basic principles of visual design to make their dashboards easier to use and more visually appealing.

This course will also give students understanding how to apply advanced formatting options such as conditional formatting and customized number formatting and handle worksheets.

Use functions such as those associated with logical, statistical, financial and mathematical operations. Create charts and apply advanced chart formatting features.

Work with tables and lists to analyze, filter and sort data. Create and use scenarios.

Validate and audit spreadsheet data.

Enhance productivity by working with named cell ranges, macros and templates.

Use linking, embedding and importing features to integrate data.

Collaborate on and review spreadsheets. Apply spreadsheet security features.

This course will also give students understanding how to import various data formats into Excel and how to use Pivot Tables to extract summary data from a single table. Demonstrates how to use Structured Query Language (SQL) in Excel. Course offers a brief introduction to statistical analysis in Excel.

Primarily covers Power BI—Microsoft’s self-service BI tool—which includes the following Excel add-ins:

- PowerPivot provides the repository for the data and processing millions of rows in multiple tables.
- Power View is reporting tool for extracting meaningful reports and creating some of the elements of dashboards
- Power Query - tool to Extract, Transform, and Load data from a wide variety of sources
- Power Map - visualization tool for mapping data.

After completing the course, students be able to install Tableau, IBM Watson Analytics and Power BI tools connect to data sources, summarize data, and create, manipulate, and share data visualizations, including highlight tables, charts, scatter plots, histograms, maps, dashboards, and more.

What are the benefits of this course?

Allows users to become more confident, efficient and effective in Big Data Analytics using Excel Business Intelligence and Power BI tools.

Proves mastery of the application.

Enables users to produce better reports with deeper data analysis.

Improves user’s productivity.

Developed with input from computer users, subject matter experts and practicing computer professionals from all over the world. This process ensures the relevance and range of module content.

This course is appropriate for beginners and business professionals with no prior analytics experience.

COURSE STRUCTURE

Course is consisted of lectures and computer practice in Excel Business Intelligence and Power BI applications.
GENERAL AND SPECIFIC OBJECTIVES OF COURSE

- Teach students how to connect to and merge data with Microsoft Power BI Desktop, IBM Watson Analytics and Tableau tools, the powerful data analysis and visualization software.
- Teach students how to connect various data sources, including Excel, Access, and web data sources (including Facebook), and search and transform the data with simple queries.
- Teach students to create charts and apply advanced chart formatting features with interactive dashboards in IBM Watson Analytics, Tableau and Power BI tools.
- Teach students how to create relationships between data sources, merge data, and build and share reports.
- Teach students to validate and audit spreadsheet data.
- Teach students to enhance productivity by working with named cell ranges, macros and templates.
- Teach students to get more insights from their data, whether it's stored on their computer or the cloud.
- Teach students to use linking, embedding and importing features to integrate data.
- Teach students how to auto-detect trends and correlations and generate predictive models and decision trees quickly.
- Teach students to think about transforming data into better decisions.
- Teach students to focuses on how the data can be used to profitably match supply with demand in various business settings.
- Teach students to collaborate on and review spreadsheets. Apply spreadsheet security features.
- Teach students to use different spreadsheets programs, tools and visualization software for data analysis.
- Teach student to understand main trends in data analysis.
- Teach students to use Business Intelligence Tools for Excel Analysts.
- Teach students to monitor and participate on global world market by using Big Data with Power BI, Excel and IBM Watson Analytics and Tableau tools.
- Prepare students for lifelong learning.
### General Course Goals
1. ZSEM students will acquire knowledge in area of technological concepts of business analytics specialization and big data.

### Specific Course Goals
1. **Students will have opportunity to understand foundations of Big Data Analytics using Excel Business Intelligence and Power BI tools from technical perspective which will give them clear picture of how modern Business Intelligence Tools for Excel Analysts applications function. Students will use this knowledge to Analysts Big Data with Power BI tools and Excel.**

2. **Students will actively participate in case discussions that will engage them in talk about different important fields from area of Data Analytics for Business. During lectures student’s participation will be important part of analyzing topic of the lecture. Helping others in online forum will also help students to improve their own communications skills.**

3. **It is essential that students understand constant advancements of technological platforms and services on which Big Data Analytics tools and Business Intelligence Tools for Excel Analysts in global environment are based. They will participate in online discussions regarding topics in modern applications of Business Intelligence Tools for Excel Analysts in today’s globalized world. Goal is to teach students to continually upgrade their own future business accordingly to the modern trends of the Big Data Analytics using Excel Business Intelligence and Power BI tools.**

4. **Through discussions, problem modeling and interpretation of solutions, students will learn how to make decisions based on analytical tools.**

### OVERVIEW OF THE MAIN LECTURE TOPICS

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Theme</th>
<th>Student Work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Introduction to the course, describes the terms of Big Data Analytics using Excel Business Intelligence and Power BI tools, and gives meaningful examples of their application.</td>
<td>Lectures</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>Power BI</strong>&lt;br&gt;What is Power BI&lt;br&gt;What is Excel self service BI&lt;br&gt;Office 365 Power BI&lt;br&gt;Enable addins in Excel&lt;br&gt;Install Power Map&lt;br&gt;Install Power Query</td>
<td>Lectures / Practical Work</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>Power Query</strong>&lt;br&gt;Power Query online search&lt;br&gt;Power Query data sources&lt;br&gt;Reducing data in Query editor&lt;br&gt;Transforming data&lt;br&gt;Append query&lt;br&gt;Duplicate query&lt;br&gt;Merge query&lt;br&gt;Get excel data&lt;br&gt;Datamart data&lt;br&gt;Troubleshooting&lt;br&gt;<strong>Excel data model</strong>&lt;br&gt;Create Excel data model&lt;br&gt;Using excel data&lt;br&gt;Using a Power Query&lt;br&gt;Data model relationships</td>
<td>Lectures / Practical Work, Practical Work</td>
</tr>
</tbody>
</table>
| 4 | **Power Pivot**  
|   | Relating database tables  
|   | Cleanup data model  
|   | Practical Work  
|   | **Power Pivot**  
|   | Create Power Pivot table  
|   | Mark date in Power Pivot table  
|   | Using slicer in Power Pivot table  
|   | Using timeline in Power Pivot table  
|   | Create Power Pivot chart  
|   | **Data tables using contoso dataset**  
|   | Create calculate columns  
|   | DAX functions  
|   | Related columns  
|   | Data hierarchy and measure  
|   | KPI-Key Performance indicator  
|   | **Spatial Data with Power map**  
|   | Power map  
|   | Format Power map  
|   | Category in Power map  
|   | Scenes in Power map  
|   | Annotate in Power map  
|   | 2D_chart in Power map  
|   | Timeline in Power map  
|   | Capture screen in Power map  
|   | Power map create video  
| 5 | **Understanding Power View**  
|   | Power View table  
|   | Save Power View project  
|   | Format Power View  
|   | Refreshing data in Power View  
|   | Change type in Power View  
|   | Add data in Power View  
|   | Using Filters in Power View  
|   | Column chart in Power View  
|   | Bar line pie in Power View  
|   | Multiples in Power View  
|   | Scatter bubble in Power View  
|   | Power View map  
|   | Slicers, cards and tiles in Power View  
|   | Needed for Power BI  
|   | Save Power Query to site  
|   | Save report to site  
|   | Explore Power BI  
|   | Understanding BI Question and answer  
|   | Synonyms in BI  
|   | Tuning data model  
|   | Practical Work  
| 6 | **Microsoft Power BI Desktop**  
|   | What are Power BI Desktop and Desktop Pro  
|   | Installing Power BI Desktop  
|   | Launching Power BI Desktop  
|   | Practical Work |
| 6 | Understanding Power BI data sources  
Connecting to a file Excel  
Connecting to a file CSV  
Connecting to a database Access  
Connecting to a web data source  
Connecting to Facebook  
Importing Excel data models |
|---|---|
| 7 | **Query Editor**  
Reducing data with the Query Editor  
Transforming data  
Inserting custom columns  
Appending data to a query  
Adding an index column  
Cleaning up data  
Creating relationships between tables  
Merging data  
Using lookup tables in a dataset |
| 8 | **Creating and arranging visualizations**  
Creating text visuals Cards, table, matrix  
Creating and formatting chart visuals  
Using a slicer to filter visuals  
Creating a map visualization  
Publishing to the Power BI service  
Republishing a dataset to the Power BI service  
Refreshing and removing datasets and reports  
Sharing and unsharing reports |
| 9 | **Creating Interactive Dashboards in Tableau**  
Building worksheets to feed dashboards  
Formatting data  
Creating visuals  
Creating calculated fields and sets  
Designing the dashboard  
Adding interactive parameters  
Keeping your Tableau dashboard up to date |
| 10 | **Learning Watson Analytics**  
Reviewing key differentiators  
Navigating the 3 Ds of Watson Analytics: data, discovery, display...  
Importing, joining, and refining data  
Using natural language querying  
Understanding key drivers  
Interpreting decision trees  
Displaying insights  
Assembling multitabbed displays and dashboard filters  
Modifying and sharing displays |
| 11 | Describes basic characteristics of Big Data with Power BI, IBM Watson Analytics and Tableau tools. |
| 12 | Discusses opportunities for and risks to the individual and the company when use Business Intelligence Tools for Excel Analysts and Power BI, IBM Watson Analytics and Tableau tools. |
GRADING SYSTEM

Evaluation of the course Big Data Analytics using Excel Business Intelligence and Power BI tools consists of several components:

Grade is formed in following way:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class presence</td>
<td>10%</td>
</tr>
<tr>
<td>Student class activity (WORKING ON YOUR PROJECT ON CLASS, answering teachers questions, participating in forum on Loomen)</td>
<td>20%</td>
</tr>
<tr>
<td>First colloquium</td>
<td>35%</td>
</tr>
<tr>
<td>Second colloquium</td>
<td>35%</td>
</tr>
</tbody>
</table>

Additional points students can get in following way:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helping others in Loomen forum and in class</td>
<td>2%</td>
</tr>
<tr>
<td>Posting and argumenting articles on innovations in the field of Big Data Analytics using Excel Business Intelligence and Power BI tools</td>
<td>2%</td>
</tr>
<tr>
<td>Class presentation</td>
<td>4%</td>
</tr>
<tr>
<td>Discussing news in course Big Data Analytics using Excel Business Intelligence and Power BI tools</td>
<td>2%</td>
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</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>0 – 49 %</td>
<td>Insufficient (1)</td>
</tr>
<tr>
<td>50 – 61 %</td>
<td>Sufficient (2)</td>
</tr>
<tr>
<td>62 – 74 %</td>
<td>Good (3)</td>
</tr>
<tr>
<td>75 – 87 %</td>
<td>Very Good (4)</td>
</tr>
<tr>
<td>88 – 100 %</td>
<td>Excellent (5)</td>
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</table>
All students should be aware that plagiarism, or any other kind of academic dishonesty, is a serious offense and can result in penalties, including failure in the course. **All work in this course regarding your final project must be your own, and dishonesty of any kind will not be tolerated.** Unless prior arrangements are made, no late work will be accepted.

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**GRADE ELEMENTS**

| STUDENT ACTIVITY | Students are expected to participate actively in class and therefore not only the presence of students is about to be recorded, but their activity in class will be scored, ie, individual work on project, participation in class discussions, the use of Loomen and participate in discussions on the Loomen. If you are not active in class you cannot expect to have more than very good (4) for final grad even if your project is perfect. | Individual student work will be monitored and students will be assessed with 20% of grade. At the end of the course, percentage will be added to other course elements. Unacceptable student behavior (surfing web during lectures, disruption of teaching, delay ...) will be penalized with negative points. If you are late more than 5 minutes please wait until class finishes that you can join on next class. |
| FIRST COLLOQUIUM AND PRACTICAL TEST | Will test everything that has been lectured in first six weeks, explained and talked about in the class. Please take notes because this will not be only PowerPoint lectures. | Six week of class we will have FIRST COLLOQUIUM AND PRACTICAL TEST. Students will sit in computer classroom. |
| SECOND COLLOQUIUM AND PRACTICAL TEST | Will test everything that has been lectured in first twelve weeks, explained and talked about in the class. Please take notes because this will not be only PowerPoint lectures. | Twelve week of class we will have SECOND COLLOQUIUM AND PRACTICAL TEST. Students will sit in computer classroom. |
| CLASS PARTICIPATION | Attend class regularly. For each missed class you have to have justified excuse. For more than 3 missed classes you’ll have to do additional work of your choice on your project in agreement with teacher. If you miss more than 4 classes you will fail this course unless you are ill. | Class attendance is worth 10% of the grade. |

**ADDITIONAL POINTS:**

- **Helping others in Loomen forum and in class**
  - If student is actively participating in helping others to overcome problems with specific issues during their project realization he/she will receive additional points for that.
  - 2%

- **Posting and argumenting articles on innovations in the field of Big Data Analytics using Excel Business Intelligence and Power BI tools**
  - If student is sharing and actively expressing his opinion about actual news in Big Data Analytics using Excel Business Intelligence and Power BI tools field he/she will receive additional points for that.
  - 2% for posting and commenting on at least 5 topics.

- **Class presentation**
  - This is mandatory activity and it’s reserved for regular and very active students who are frequently helping others and are continually engaged in class. You can choose any of the actual Big Data Analytics using Excel Business Intelligence and Power BI tools topics and give 10min presentation in front of the class.
  - 2–4% depending on the quality of your presentation.

- **Discussing news in Big Data Analytics using Excel Business Intelligence and Power BI tools**
  - Teacher will frequently ask about whether your have read any kind of news from Big Data Analytics using Excel Business Intelligence and Power BI tools. You can shortly explain about news you’ve read.
  - If you engage in this activity more than 4 times you can get extra 2%.
BY ZSEM STATUTE STUDENTS ARE OBLIGED TO REGULARLY ATTEND ALL ACTIVITIES. THIS IS REGULARLY EVIDENCED. IN CASE YOU MISS MORE THAN 25% OF ACTIVITIES ALL TOGETHER (LECTURES, LAB WORK ETC.) YOU CANNOT GET SIGNATURE FROM THIS COURSE NOR SIGN UP FOR FINAL EXAM. YOU WILL HAVE TO TAKE THIS COURSE AGAIN NEXT YEAR. ONLY LEGITIMATE EXCUSES ARE CONFORMATION OF SICKNESS FROM YOUR DOCTOR AND SIMILLAR.

LITERATURE

Basic literature
- Introducing Microsoft Power BI: Alberto Ferrari and Marco Russo, Microsoft Press 2016
- Getting started with Watson Analytics: IBM Corporation 2015

Additional literature:
- IBM Watson Content Analytics Discovering Actionable Insight from Your Content: Wei-Dong (Jackie), Zhu Bob Foyle, Daniel Gagné, Vijay Gupta, Josemina Magdalen, Amarjeet S Mundi, Tetsuya Nasukawa Mark Paulis, Jane Singer, Martin Triska, ibm.com/redbooks, IBM Corporation July 2014

Loomen is basic part of education on ZSEM. Using Loomen is obligatory for all students and professors. All students are obligated to daily check all announcements on Loomen (Calendar, Forum, Loomen mail etc.)