



COURSE SYLLABUS

EXCEL FOR MATHEMATICAL MODELLING

(ECTS 4)

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

LECTURER

Lecturer Mr.sc. Franjo Borović

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.

Private communication: fborovic@zsem.hr

Office: MBA building (behind the computer classroom)

COURSE HOURS

Lectures	16 hours (8 x 2 hrs)
Computer practice	26 hours
Project presentations	3 hours
FINAL	45 hours

COURSE DESCRIPTION

Presents candidates with the opportunity to bring their spreadsheet skills to an expert level. Completion of this course will enable candidates to master the more advanced functions of spreadsheet applications, enabling them to produce more sophisticated reports, and to perform complex mathematical and statistical calculations, thus saving time and improving productivity in the completion of tasks.

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.

What are the benefits of this course?

Allows users to become more confident, efficient and effective in using a spreadsheet application.

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.

COURSE STRUCTURE

Course is consisted of lectures and computer practice in spreadsheets applications.

GENERAL AND SPECIFIC OBJECTIVES OF COURSE

- Teach students to apply advanced formatting options such as conditional formatting and customized number formatting and handle worksheets.
- Teach students to use functions such as those associated with logical, statistical, financial and mathematical operations.
- Teach students to create charts and apply advanced chart formatting features.
- Teach students to Work with tables and lists to analyst, filter and sort data. Create and use scenarios.

- 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 use linking, embedding and importing features to integrate data.
- Teach students to collaborate on and review spreadsheets. Apply spreadsheet security features.
- Teach students to use different spreadsheets programs and tools
- 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 and Excel
- Prepare students for lifelong learning

	<u>General Course Goals</u>	<u>Specific Course Goals</u>
1.	ZSEM students will acquire knowledge in area of technological concepts of using spreadsheet to an expert level	Students will have opportunity to understand foundations of the Excel for Mathematical Modelling 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 and Excel.
2.	ZSEM students will be effective communicators and possess presentation and communication skills (written and oral).	Students will actively participate in case discussions that will engage them in talk about different important fields from area of Excel for Mathematical Modelling. 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.	ZSEM students will have the capacity for adaptation which is necessary for doing business in the global environment.	It is essential that students understand constant advancements of technological platforms and services on which Excel applications 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 Excel for Mathematical Modelling.

OVERVIEW OF THE MAIN LECTURE TOPICS

Lecture	Theme	Student Work
1	Introduction to the course, describes the terms of excel for mathematical modelling , and gives meaningful examples of their application.	Lectures
2	Formatting Cells and Worksheets Apply an autoforamt/table style to a cell range. Apply conditional formatting based on cell content. Create and apply custom number formats. Copy, move worksheets between spreadsheets. Split a window. Move, remove split bars. Hide, show rows, columns, worksheets.	Lectures / Practical Work

3	<p>Functions and Formulas</p> <p>Use date and time functions: today, now, day, month, year. Use mathematical functions: rounddown, roundup, sumif. Use statistical functions: countif, countblank, rank. Use text functions: left, right, mid, trim, concatenate. Use financial functions: fv, pv, pmt. Use lookup functions: vlookup, hlookup. Use database functions: dsum, dmin, dmax, dcount, daverage. Create a two-level nested function. Use a 3-D reference within a sum function. Use mixed references in formulas.</p>	Lectures / Practical Work
4	<p>Creating and Formatting Charts</p> <p>Create a combined column and line chart. Add a secondary axis to a chart. Change the chart type for a defined data series. Add, delete a data series in a chart. Re-position chart title, legend, data labels. Change scale of value axis: minimum, maximum number to display, major interval. Change display units on value axis without changing data source: hundreds, thousands, millions. Format columns, bars, plot area, chart area to display an image.</p>	Practical Work
5	<p>Analysis (Using Tables, Sorting and Filtering, Scenarios)</p> <p>Create, modify a pivot table/datapilot. Modify the data source and refresh the pivot table/datapilot. Filter, sort data in a pivot table/datapilot. Automatically, manually group data in a pivot table/datapilot and rename groups. Use one-input, two-input data tables/multiple operations tables. Sort data by multiple columns at the same time. Create a customized list and perform a custom sort. Automatically filter a list in place. Apply advanced filter options to a list. Use automatic sub-totalling features. Expand, collapse outline detail levels. Create named scenarios. Show, edit, delete scenarios. Create a scenario summary report.</p>	Practical Work
6	<p>Validating and Auditing</p> <p>Set, edit validation criteria for data entry in a cell range like: whole number, decimal, list, date, time. Enter input message and error alert. Trace precedent, dependent cells. Identify cells with missing dependents. Show all formulas in a worksheet, rather than the resulting values. Insert, edit, delete, show, hide comments/notes.</p>	Practical Work

7	<p>Enhancing Productivity</p> <p>Name cell ranges, delete names for cell ranges. Use named cell ranges in a function. Use paste special options: add, subtract, multiply, divide. Use paste special options: values /numbers, transpose. Create a spreadsheet based on an existing template. Modify a template. Insert, edit, remove a hyperlink. Link data within a spreadsheet, between spreadsheets, between applications. Update, break a link. Import delimited data from a text file. Record a simple macro like: change page setup, apply a custom number format, apply autoformats to a cell range, insert fields in worksheet header, footer. Run a macro. Assign a macro to a custom button on a toolbar.</p>	Practical Work
8	<p>Collaborative Editing (Tracking and Reviewing, Security)</p> <p>Turn on, off track changes. Track changes in a worksheet using a specified display view. Accept, reject changes in a worksheet. Compare and merge spreadsheets. Add, remove password protection for a spreadsheet: to open, to modify. Protect, unprotect cells, worksheet with a password. Hide, unhide formulas.</p>	Case study / Practical Work
9	Describes basic characteristics of Big Data with Power BI and Excel.	Case study / Practical Work
10	Discusses opportunities for and risks to the individual and the company when use Business Intelligence Tools for Excel Analysts .	Final project presentation (individual)

GRADING SYSTEM

Evaluation of the course Excel for Mathematical Modelling consists of several components:

Grade is formed in following way:

Class presence	10%
Student class activity (WORKING ON YOUR PROJECT ON CLASS, answering teachers questions, participating in forum on Loomen)	20%
First colloquium	35%
Second colloquium	35%

Additional points students can get in following way:

Helping others in Loomen forum and in class	2%
Posting and arguing articles on innovations in the field of Excel for Mathematical Modelling	2%
Class presentation	4%
Discussing news in Excel for Mathematical Modelling	2%
Possession or realization of European Computer Driving Licence /International Computer Driving Licence in module Advanced Spreadsheets (AM4)	30 %

%	Grade
< 60	Insufficient (1)
61 – 70	Sufficient (2)
71 – 80	Good (3)
81 – 90	Very Good (4)
≥ 91	Excellent (5)

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.

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 arguing articles on innovations in the field of Excel for Mathematical Modelling	If student is sharing and actively expressing his opinion about actual news in Excel for Mathematical Modelling field he/she will receive additional points for that.	2% for posting and commenting on at least 5 topics.

Class presentation	This is optional activity and it's reserved only for regular and very active students who are frequently helping others and are continually engaged in class. You can choose any of the actual Excel for Mathematical Modelling topics and give 10min presentation in front of the class.	2-4% depending on the quality of your presentation.
Discussing news in Excel for Mathematical Modelling	Teacher will frequently ask about whether you have read any kind of news from Excel for Mathematical Modelling. You can shortly explain about news you've read.	If you engage in this activity more than 4 times you can get extra 2%.
Possession or realization of European Computer Driving Licence /International Computer Driving Licence in module Advanced Spreadsheets (AM4)	This is optional activity in which each student will be offered the opportunity to purchase an ECDL index and give him the possibility of certification in the ECDL Test Exam Center	Possession or realization of European Computer Driving Licence /International Computer Driving Licence in module Advanced Spreadsheets (AM4) is worth 30% of the grade.

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

- ECDL Advanced Syllabus 2.0 Revision Series Module AM4 Spreadsheets (Cia Revision Series) (book)

<https://www.amazon.co.uk/Advanced-Syllabus-Revision-Module-Spreadsheets/dp/1860058078>

- ECDL Advanced Syllabus 2.0 Module AM4 Spreadsheets Using Excel 2010 (workbook)

https://www.amazon.co.uk/Advanced-Syllabus-Module-Spreadsheets-Using/dp/1860058507/ref=pd_sim_14_2/257-6027742-4530206?_encoding=UTF8&psc=1&refRID=GRGH3ESDDSDS7PV33K1G

Additional literature:

- Microsoft Business Intelligence Tools for Excel Analysts: Michael Alexander, Jared Decker, Bernard Wehbe, 2014 by John Wiley & Sons
- Beginning Big Data with Power BI and Excel 2013: Neil Dunlop, 2015

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.)