

# Information Systems and Data Management – 27006

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Course overview and course website

## Basic computer

Capacity measures. Moore's law. Data storage devices.

Operating systems, operating systems for mobile devices, programs, data files, software licenses, total cost of ownership, software naming, data formats license.

Windows versions and editions. Regional and language settings. Keyboard setting.

Windows File system: viewing files' extensions, files' tree structure, disks, disks at UNIBZ, directories, absolute addresses, files, links. File operations: run, open, open with, copy, move, rename, delete, link, compress files, compress with password. File types and common extensions.

File permissions, Users and groups, Authorizations.

How to access UNIBZ network directories, how to reach unibz network disks from notebooks, from Windows and from Mac.

UNIBZ network directories, virtualization, quota limit.

## Computer networks

How to open tickets at UNIBZ.

Sharing resources, server and client. Virtualization and VM. LAN, WAN and VPN. Bits per second and bytes per second. Ethernet, fast Ethernet and Gigaethernet cables and wireless speed.

Communication programs: web browsers, mail clients, webmail, Posta Elettronica Certificata, VoIP and its costs, WhatsApp.

Search engines: crawler, Google scoring system, keywords, AND/OR searches, using quotations, searching for images.

Internet connections: ADSL, upload and download speeds, Internet cable, GPRS, UMTS, LTE, wireless connection, digital divide, WiMax.

Technical requirements of Italian law 196/2003 on privacy.

Encryption, digital signature, certification authority, keys expiration, temporal mark, comparison with handwritten signature.

Passwords: what are the risks, legal obligations, suggestions, biometric and personal devices.

Viruses: types, CryptoLocker, behavior, infection symptoms, user's responsible behaviors. Anti-viruses: how do they work.

Spam: advertisement, letters' chains, frauds, phishing. Suggestions against phishing. Antispam.

Navigation security: data interception and secure connection https. Denial of Service attack. Firewall.

Backup: why doing backup, what to backup, where to copy the files, JBOD, RAID 0-1-10.

## Excel

Cells' references, columns, rows, name box, formula bar, autocalculate, sheets tab. Selection of non-rectangular areas.

Multiple sheets: create, rename, color, move and copy, cell references across sheets.

Numbers' formats. Data types: values (general, number, currency, date, time, percentage), formulas, text. Cell format dialog box. Data entry and conversion: problems with dates and with percentages.

Autofill, autoincrement. Copy, paste, paste value only.

Importing tables from other programs: fixed fields, tab-delimited and character-delimited tables.

Excel formulas: mathematical operations, relative cell references, absolute cell reference, partial absolute cell reference, formula dragging. Functions and help on functions.

Mathematical functions: LOG, SQRT, EXP, LN, PI, ABS, ROUND, ROUNDDOWN, ROUNDUP, RAND, RANDBETWEEN, MAX, MIN, SUM, AVERAGE, conditional aggregations SUMIF, COUNTIF, AVERAGEIF.

Logical functions: IF, NOT, AND \*, OR +.

Text functions: LEN, RIGHT, LEFT, CONCATENATE, REPT.

Date and time serial format and operations. Date functions: NOW, TODAY, DAY, WEEKDAY, MONTH, YEAR, DATE, undocumented function DATEDIF.

Net present value, internal rate of return, yearly net rate, yearly real global rate, loans with constant payments, loan with variable payments, redetermine the payment. Financial functions: XNPV, XIRR, PMT, IPMT, RATE, NPER.

Visual Basic for Applications' user-defined functions: functions, if-then-else constructs, nested ifs, MsgBox, UCase, Left, Sqr. Range as parameter, .Rows.Count, .Columns.Count, .Cells.Count, for each next, summing elements.

Statistical functions: STDEV.S, VAR.S, NORM.DIST, NORM.INV.

Goal seek. Scenario management. Assigning cell's name. Sensitivity analysis with data table. Solver.

Printing: preview, page setup, orientation and scaling, margins and centering, header and footer, printing area, rows and columns titles, gridlines, page order.

Document types: xlsx, xls, csv, txt, pdf. Producing and protecting PDF files.

Conditional formatting.

Charts: chart wizard, selecting non-rectangular areas, changing data range and custom series, add and modify data, layout, style, location, plot area features. Axis features, legend, titles, labels, pie chart features.

Chart types for 1 data series: column, bar, line, area, pie. Multiple data series: selecting non-rectangular areas, clustered and stacked column/bar/line/area, scatterplot, bubble. Difference between scatter plot and line plot.

Selection of non-rectangular areas. Illustrations' shapes: non transparent text box, arrow.

Viewing: hiding and unhiding cells, freeze panes, comments.

Removing hyperlinks, sorting tables, filtering tables, sheet protection.

Pivot tables and Pivot charts.

Analysis ToolPak installation for Excel 2007-2010. Statistics with Excel: descriptive statistics, building histograms of numerical variables.

## Relational databases

Single-table databases: features of a database table, fields and records.

Multiple-table databases: information redundancy, space waste, relations, relational databases.

Relations: one-to-many, many-to-one, one-to-one, many-to-many, junction table, primary key and ID, referential integrity, foreign key, foreign key connected to two tables. Temporal versus static databases.

Designing a new database: think at your problem, build a paper diagram, start from external tables, check that relations are properly oriented, add junction tables, fields names and types with options, description of the not obvious ones and non-standard decisions.

## Microsoft Access

What is Access, Access' competitors.

MyFarm database example, Northwind database example, database file locking and security, Northwind database overview.

Automatic data save by Access, undo, non-automatic object save for Access, how to backup database.

Tables: datasheet view, design view, field types (text, memo, number, currency, date/time, yes/no, OLE object, index, hyperlink), field properties (size, format, decimal digits, required, allow zero length, validation rule, validation text), table validation rule, building Access tables, importing data from Excel files.

Relationships: relationships' diagram, create/modify/delete relations, enforcing referential integrity. Create relations using Lookup Wizard, create predetermined lists using Lookup Wizard and using values taken from another table.

Forms: what is a form, create using wizard, view/add/modify/delete records, subform, form locking.

Query: what is a select query, create using wizard, design view, no-show option, sorting, criteria, criteria in And and Or, adding tables, adding fields, creating virtual fields, Expression Builder (DATE, DATEDIFF, YEAR, LOG, ABS, SQR, EXP, INT, LIKE, BETWEEN). How to save objects inside database.

Summary query: group by option, count/sum/average/max/min options, using where option by for conditions.

Report: what is a report, create from tables or queries, create using wizard, grouping levels, sorting, export in RTF.