

# Information Literacy

Week 00

Course overview

Professional communication tools

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# Course overview

1. Communication tools
2. Text processing
3. Number processing
4. Presentations
5. File organisation
6. Command line and scripts
7.     command sequencing
8.     shell variables
9.     conditionals, loops
10. The Internet
11. Data mobility
12. The World Wide Web
13. Content creation
14. Web 'app's, cloud services
15. Safety and security

Assigned preparation given for some classes  
+ corresponding quick quiz at start of that class

# 1. Professional communication tools

- Interactive tools

- Telephone, Skype, instant messaging, 'team ware' / Slack
- Advantages (real-time), disadvantages (disruptive)

- Non-interactive tools: e-mail

- Why e-mail is still relevant for professionals in 2020
- Effective communication with e-mail
  - Good subject line – know when (and how) to change it
  - Quoting
  - Threads and conversations
- Exchanging information in e-mail attachments
- Zip files

- Deliverable: send a good e-mail to a TA with attached zipped files

[Online preparation: <https://support.office.com/office-quick-starts>]

## 2. Text processing

Word

[online support: <https://edu.gcfglobal.org/en/word>]

- Using simple layouts (function over form), simple language
- Styles and templates
- Automation: spell checking, auto-replacements
- Embedding images
- Mathematical formulae
- Line drawings
- Meta information: table of contents, index, citations
- Alternatives to Microsoft – GOOGLE DOCS FOR COLLAB – inkscape, gimp...
  - WYSIWYG: Libre office Writer, Scribus (for books)
  - Academic/technical: LaTeX / BiBTeX
  - Publishing and professional: Quark, Adobe

# 3. Number processing

Excel [online support: <https://edu.gcfglobal.org/en/excel>]

- Spread sheet paradigm and concepts
- Tabulation
- Computed content: formulae
- Import and export of data, CSV files
- Graphs and charts
- Tips and tricks
  - Anchoring cell references
  - Conditional expressions in a formula
  - Indirect access to cell content in a formula
- Keyboard shortcuts: three times faster than 'clickety-click'

# 4. Presentations

PowerPoint [online support: <https://edu.gcfglobal.org/en/powerpoint>]

- Slide metaphor, title, content
- Using simple layouts (function over form)
- Text, lists, tables
- Spell checking, auto-correct, auto-replace
- Views: master, normal, outline, presentation
- Page templates and customisation, backgrounds
- Images and drawings
- Mathematical formulae
- Exporting as PDF for sharing or printing

# 5. File system organisation

- File system media: SSD, HDD, Flash
  - Reliability, MTBF, unsuitability of Flash for normal work files
  - Making regular backups
- File system layout and organisation
  - Regular files vs. directories/folders
  - Hierarchical organisation and the 'tree' metaphor
  - Organisational strategies for directories and files
- Navigation
  - Finder/explorer
  - Command-line directory listing
- Finding files by name or type
- File attributes: access permissions, timestamps

# 6. The command line

- The command line makes you a more productive/effective engineer
  - Apply operations to many files at once
  - Save commands in a script file to automate data processing tasks
- Unix/Linux/MacOS terminal 'shell' vs. Windows command prompt
- Commands and arguments compared to words in text
- Processing file contents using command-line programs
  - Searching, sorting, modifying, analysing data in text files
- Standard input and output
- Pipelines: combining simple commands to perform complex tasks
- Using CSV files as simple databases
- Editing plain text files

[online support: <http://swcarpentry.github.io/shell-novice>]



# 7. Command sequencing

- Files as a natural target for automated processing
  - First 'concrete' objects students formally encounter in the computer
- Scaling operations
  - One operation on multiple files
  - Multiple operations on one file
  - Multiple operations on multiple files
- Saving command sequences as a script
- Editing shell scripts
- Accessing command-line arguments in shell scripts

# 8. Shell variables

- Variables: assigning, accessing
- Filename expansion and 'globbing'
- Iterating over multiple files using a variable
- Parameter substitution
  - Prefix, suffix removal
  - Pattern replacement
- Indirect command execution
  - Using command output as an argument to another command
- File name manipulation
- File attribute manipulation
  - The 'touch' command

# 9. Conditionals and loops

- Command exit status
  - Success or failure as useful information
- The 'if' statement
  - Selecting behaviour according to success or failure
  - Selecting behaviour according to variable content
- The 'case' statement
  - Selecting behaviour according to string patterns
- The 'while' statement
  - Repeating behaviour according to a condition
- Common idioms in shell scripts
- Scriptable commands: sed, awk

# 10. The Internet

- How the Internet works
  - Names — what you want
  - Addresses — where to find it
  - Routes — how to get there
- Standard services: web, ssh, mail, ...
- Finding information online: tips, tricks, and risks
  - Search engines for text and other media types; media rights
  - Wikipedia, YouTube, permanence of online data, etc.
  - Reliable sources: Wolfram MathWorld, Google scholar, RG, digital libraries (, cf. physical library?), citeseer, DOI, etc.
- The difference between the Internet and the World Wide Web

[online support: <https://edu.gcfglobal.org/en/topics/internet/>]

# 11. Data mobility

- The network is the computer
  - Remote login with ssh
  - Remote desktop with RDP/VNC
  - Remote windows with X11
  - Network file systems: NFS, SMB, AFP
- File transfer protocols and applications
  - FTP, scp, rsync
- Data distribution and file sharing
  - Centralised: Web site, FTP server, Dropbox
  - Decentralised: peer-to-peer, Syncthing
  - Advantages and disadvantages
- How to share very large files

# 12. The World Wide Web

- The Internet vs. the World Wide Web
- Universal resource indicators and locators
  - Components and interpretation of web addresses
- Content delivery
  - Server
  - Client
  - Protocol
- Hyper-Text Transfer Protocol
- Hyper-Text Mark-up Language
- Anatomy of a simple web page

# 13. Content creation

- HTML and the structure of web pages
  - Meta content
  - Body content
- Common tags and content types
  - Headings, paragraphs, lists, tables
  - Anchors
    - External links
    - Internal links
  - Images and other media types; appropriate image/video resolution, etc.
- Style
- Cascading Style Sheets
- Search Engine Optimisation

# 14. Web applications and cloud services

- Client-server model and HTTP POST requests
- Automatic content generation
  - Server-side: PHP + database
  - Client-side: JavaScript
- Structured data mobility: XML and JSON
- Data and code repositories
  - File versioning
  - Check-in, check-out, modify+commit
  - Branching, merging, conflict resolution
  - Centralised (Subversion) vs. decentralised (Mercurial) vs. github/lab
  - Risks and benefits
  - Why you should always use a repository for important source code



# 15. Safety and security

- Sensitive information
  - Confidential: personal, financial, proprietary, personally identifiable
  - Behavioural: trackers; meta/EXIF data in images, etc.
- Effective use of passwords
  - Risks of 'remember me' or 'keep me logged in' options on web applications
- Security basics
  - Encrypted communication: ssh, HTTPS
  - How to encrypt files, archives, e-mails
  - Password protecting your web pages or site
- Malware, spyware, viruses, & M\$ macros
- Effective backup strategies

[online support: <https://edu.gcfglobal.org/en/internetsafety>]

# comments

- How to make good students help weaker ones
- How to manage diversity of skills in general
- TA guide?