Manual

This manual is just a combination of the online-document files.

```
electure - Online Lecturing System v2.20
Copyright (C) 2001, 2002, 2003, 2004  C.B. Lang and T.C. Lang
License information in doc/LICENSE-information
http://physik.uni-graz.at/~cbl/electure
http://electure.sourceforge.net
```

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1. Introduction

Introduction

"Easy to install - easy to use."

electure is a free e-education package to facilitate the design and presentation of electronic lectures. It has evolved from the presentation of courses in a university environment. Different from other (predominantly commercial) e-learning systems, **electure** is an individual solution; usually it is installed for individual courses by the lecturer or course administrator and direct, uncomplicated access to the features and contents of the course is possible.

The guiding idea was to build a modular system that is simple to install and use for lecturers, who have some familiarity with writing web-documents (with html-editors or directly as html-code) but are not experts in web-software. It is easily possible to insert and combine existing web-documents. However, it is also possible to include other types of documents, either by linking to them as usual in web pages, or through a working area available to course users.

From version 2.0 onwards we have included collaborative tools like e.g. a discussion forum or a user file space in order to allow project oriented communication between the students.

Here are the main features:

The lecturer

- writes for the content part lecture units as standard html-documents (i.e. may use any html-editor for preparation of the units); this may provide an ordered path through the material. Alternatively one could organize the course by table-of-contents-like tree structure and use other document formats (like MS-Word or PDF files); these will not be inter-linked internally as the html files are.
- uses certain special commands embedded in the documents in order to provide correct
  - internal links to other lecture units
  - links to separate external URLs
  - links to special exercises (in form of other html-documents)
- may easily modify the main features of the presentation environment (like titles, colors, font styles, menus) in one list of parameters
- may conveniently change the language for the students' access
- may interactively insert, delete and modify exercise pages
- may simply modify any of the lecture html-documents without affecting the running system
- may interactively combine the units for production of a print file document (e.g. lecture notes)
- can control the students' access with help of a userid/password system including user application forwarding and group structuring
- may arrange for collaborative groups of students
- may follow the progress of the student via simple calls to an SQL-data base (realized via html-pages)
- can set up and manage a discussion forum, a chatbox and a user file space for collaborative learning

The students

- read and work with the lecture interactively via any web browser
- may add their comments to all lecture units
- evaluate the self-controlling exercises online

- may print individual documents of lecture-prepared notes
- may work in collaborative working groups and exchange or publish files in a userspace "Filedepot"
- can contribute to a discussion forum (or in the chatbox) on topics of the course
- can easily mail to their peers within the students' groups

Individual extensions

Since simple usage is our prime concern. We do not provide many extensions to evaluate the users' (students') behavior. Some statistics features are included and discussed in the FAQs. It is also possible to provide menu-links to further external features like visualization tools, external chat-boxes etc.

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2. Installation

Download

Download of the package is possible from the original **electure** homepage.

The package **electure** consists of a collection of PHP-script files and documentation. It has been used on Linux installations but should work on other UNIX-derivates too.

Once set up, your Online Lectures reside on your web space of some (maybe your) web server A fully functional system should provide the following prerequisites

System requirements: the web server (obligatory)

The lecturer needs to have access to filespace on a webserver. The scripts and lectures may be installed on any users' (lecturer's) web space and (except for activating the data base at installation time, see below) no root support is necessary. During the installation the lecturer needs login- and ftp-access to her/his account on the webserver, for later administration this is

not necessary.

PHP support (obligatory)

PHP is a widespread public domain scripting language. The web server should have PHP embedded (this is becoming standard for apache web servers).

» Link to PHP distribution

(The implementation of PHP is obligatory for the **electure** package. In case of problems consult the FAQs concerning the required extension of your php-interpreter.)

SQL support (obligatory)

MySQL is a public domain data base system. The lecturer should have the possibility to access the SQL data base. The initialization of a new data base may require root privileges. The database for a given course is accessed through PHP-scripts and web-interfaces (like MySQLAdmin).

» Link to MySQL distribution

(Some implementation of SQL is obligatory for the **electure** package.)

ht://Dig (suggested very much)

This is a public domain package allowing a search of your html (course) documents, in case you want to implement a keyword search. Its embedding into the course's user surface is prepared.

» Link to ht://Dig home page

phpMyAdmin (suggested)

This is a public domain package allowing easy administration (via web-interfaces) of the SQL-data base.

» Link to phpMyAdmin distribution

Although we recommend this interface, you do not need it for running the course, although it may be helpful. You may of course choose other methods to access the data base.

Once these features exist on the lecturer's web server, the **electure** package may be installed in the lecturer's web space and the lectures put on the web.

Installation details

Please read these instructions carefully and **proceed step by step**.

The **electure** package consists of a set of php-scripts and some supplementary material. The idea is to install the package as a template for your course. The installation script sets up all necessary files and directories in your course folder within your web space Any other courses correspond to other copies in

other folders.

You have downloaded the package `electure-vx.xx.tgz` into some folder of your choice.

1. **Untar and unzip:** Enter that folder and unzip and untar it:
   - For installations, where tar supports the z-option:

     ```
     tar xzf electure-vx.xx.tgz
     ```

   - For other installations:

     ```
     mv electure-vx.xx.tgz electure-vx.xx.tar.gz
     gunzip electure-vx.xx.tar.gz
     tar xf electure-vx.xx.tar
     ```

   This creates a folder entitled `electure-vx.xx` which contains a `README` file and a folder entitled `SampleCourse`.

2. **Rename:** Enter now the folder `electure-vx.xx` and move (rename) the folder `SampleCourse` to your web space. If your web home is `$HOME/public_html` and your course should be accessed under the URL

   ```
   http://your.webserver.address/~yourid/MyCourse/
   ```

   then you should type

   ```
   mv SampleCourse $HOME/public_html/MyCourse
   chmod -R a+rX $HOME/public_html/MyCourse
   ```

   (Replace the course name `MyCourse` by the name you want to use.) This creates the online course directory, e.g. `$HOME/public_html/MyCourse` and opens it for access by the webserver. Some folders (like the installation folder) may later be "closed to the public".

3. **general_vars.inc.php:** You now enter the course home subfolder `inc`

   ```
   cd $HOME/public_html/MyCourse/inc
   ```

   and edit the file `general_vars.inc.php` containing general variables (like title, paths etc.) of your course. (Maybe you want to save a copy of the original file.)

   This step should be done carefully, take your time and read the commented information in the file. The file should be edited in a normal text editor. You can specify details like

   - The name of your course, the lecturer's e-mail address and the location of various folders.
   - The lines with Meta Tags to be included or not in the header-part of the running course. This allows you to exclude robots or to include the "favicon" feature (the small icon in the URL-line of the user's webbrowser).
   - Data base details; you may switch off the data base. In this case there is no restriction to access the course. However, this disables many of the salient features (like user login, forum, filedepot and other user activities).
   - Information on the userspace area 'filedepot', limits on allowed maximum filespace and individual file sizes.
   - Normally the title images and various button are built during the installation process (see below). This needs GD-library support compiled into the php-module. And then there is still the chance that the installation supports either TrueTypeFonts (ttf) or Postscript Type

1 Fonts (pfb, "t1lib"). The requested version of the font is defined in the file `modules/makeimages/localinc/makeimages.inc.php` (relative to the course's home) . During the setup you will get a message, what font type is possible. If it disagrees with the default value, please change the mentioned file accordingly. Then you may proceed (if you chose the correct one).
- If you have no GD-library support at all in your php-module you may switch off that image-generation feature. Buttons and title images will look not as nice in that case.
- Title field: title, subtitle, colors
- Sizes and colors for fonts and title background may be customized in the file `modules/makeimages/localic/makeimages.inc.php` (cf. the FAQs for more details).
- Course menu entries and specific links (keep, change, add or remove them according to your wishes)
- Specification, whether you want to activate the search feature (which lets your students search for a word or string in the course material) and the location of a search program.
- Details like name of the course's data base (please use only characters for its name!), lecturer userid/password for data base access
- You may specify, whether the login feature should be disabled and whether the users should be allowed to add public notes

The file contains information on the necessary changes. *Absolutely necessary changes* are indicated by the comment line "MANDATORY CHANGE:"

You find more information in "FAQs" under menu point "installation".

4. **Check the configuration and start the installation process:** Call the the page *install.html* in the folder install, i.e. open in your web browser the URL

   `http://your.webserver.address/~yourid/MyCourse/install/install.html`

   The internal consistency of the variables of your course and the availability of used executables is checked and the necessary files are created during this setup process. You are informed about possible problems.

Database-installation: In a standard installation you will want to use an SQL data base for the course. For this the SQL-Administrator (often the SysAdmin) has to create the data base and add you as an SQL-user. The necessary script for this will be provided during the installation process and you can forward this to the SQL-Admin. When this is done, you proceed with the installation process in the browser.

During the installation you are asked to execute (from your account on the webserver) two scripts (*setup-open.sh* and *setup-close.sh*) in order to allow the webserver to create some files in your course's home (like the **userspace/Filedepot** or some **image files**). You will be informed when this is necessary and for this you should have login-access to your filespace on the webserver.

After the installation

Once the setup has been completed and the database has been installed, the lecturer (course administrator) may find further information (changing the setup, user administration, exercise administration, lecture notes etc.) under the URL

`http://your.webserver.address/~yourid/MyCourse/admin/`

The access to these pages is restricted to the lecturer. The access id and password was defined in the file `inc/general_vars.inc.php` as discussed above. You need this password in order to access the admin area. As a first step you should (possibly create a group and) give yourself a user identity for logging in as a standard user. This can be done by choosing the entry "Administrate users" and then "Add a user to the course's database".

Important: There is a hierarchy of userid/passwords

- Only **the SQL-Admin** knows the userid/passwd for setting up another data base in the MySQL system.
- In the file `inc/general_vars.inc.php` you have defined your lecturer's userid/passwd for **access to the course database**. This allows you (and indirectly, via the php-scripts to a limited amount also the course users) to access data in the course's data base. This userid/passwd may be changed only when also changing the corresponding MySQL-entries.
- The **course's administration area** (`http://your.webserver.address/~yourid/MyCourse/admin/`) and parts of the installation script are restricted to the course's administrator (the lecturer) for various tasks like installing course users, adding exercises etc. Access to this area is via another userid/passwd combination has been defined in the file `inc/general_vars.inc.php`. You may freely change this userid/passwd at any time.
- Finally, unless you have disabled the login feature, all **standards users of the course** (the students and you, when testing the course as a student) need to have a userid/passwd for login to the course. This userid/passwd has to be defined by you with help of the "administrate users" feature in the admin area and may be modified any time.

Now you are ready access the course in your web browser with the URL

```
http://your.webserver.address/~yourid/MyCourse/
```

Try to login with the userid/passwd combination you have defined for the lecturer ("working as a standard user").

A sample course has been provided to allow a quick and easy check of the main features. You will be instructed to activate the exercises and to create the tables for the search function. You may also use the sample as a starting point for you own content.

In the login menu there is also an application form for new users. Whoever wants to join the list of users may fill up this application form. The information then is mailed to the course administrator's e-mail address as given in the file `general_vars_inc.php`. That e-mail message contains a shortcut-link, which allows the course administrator the almost-automatic installation of the new user. The users themselves may change their password and e-mail address at any time with help of the course's login menu.

Further hints

Once the setup process has been completed, it is generally a good idea to remove the general access and read admission for the installation folder `MyCourse/install` by executing e.g.

```
cd MyCourse
chmod -R og-rX install
```

(where MyCourse denotes your course home). Remember, however, to open the access again (`chmod -R og+rX install`), whenever you want to repeat the setup, rebuild the images or perform

the various installation checks from that folder!

In case any prerequisites (like php-support or MySQL) are missing at your webserver installation please consult again the download-page for further information and links and the page FAQs.

Your course's contents files will end up in the folder

```
http://your.webserver.address/~yourid/MyCourse/contents/
```

After the initial installation there are already some sample files in this folder. When adding your own material you may remove most of them. However, some of these files are addressed by menu items (filenames defined in `inc/general_vars.inc.php`) and you may remove them only if you have removed these menu items in the setup. Some files are mandatory by **electure**-scripts, although you may change their names defined in `inc/general_vars.inc.php`. These are the files

```
contents/motd.html
contents/newlogin.html
```

You should adapt their content to your needs.

More information can be found in the HowTo-documentation.

Demo

For demonstration you have user access to a sample course entitled "Electure Sample Course". This is almost the same course as the one called "MyCourse" which is distributed as a course template with the installation package. It demonstrates some of the available feature. However: Most likely you can do much better with your own course.

When entering you first will have access only to the public part of the demo course (introduction etc.). For full access you have to login (cf. the course menu bar with the login button). You may use the userid/passwd: guest/guest for testing the features of the Online Lecturing System. However, you will not be able to inspect the admin-features.

» Link to "Electure Sample Course"

Please keep in mind, that the contents of the course and the presentation of the course units is within the responsibility of the respective lecturer. The **electure**-system only provides the arena for the performance of the course's author.

---

3. How to run a course

HowTo

After having installed the course, here you find information on how to further configure and test the installation and implement your own course material.

You also find a complete version of all the information files collected as a manual (pdf version).

- Remarks on organizing your course

  Some preparatory considerations on the available tools and whether to use them in the course

- Administrating the online course

  When the setup of the course is completed, you may supervise the course, add new exercises, administrate the user data base etc.

- Users, groups and folders

  Take a moment to organize the groups and users of your course.

- Structure of your online course

  Here the structure of the electure course directory is discussed.

- How to prepare the online course units

  This gives you information on the format of the online course units in the contents folder, the html-files and a few commands.

- Security

  Comments on security.

- FAQs

  A list of frequently asked questions, related to installation problems and extensions of the course features.

Remarks on organizing your course

You, the lecturer, have to decide on how to organize the course and there are many concepts. We discuss here only some possible implementations. In order to prepare the field let us first give a brief overview on the features available in **electure**.

The lecturer's contents area

This is the classical part of e-lectures. It allows the lecturer to set up course material in a structured way. The material may consist of individual html-files ("frames"), which may be arranged with links to at preceding and a subsequent frame. This sounds quite one-dimensional, but of course there may be many further links to internal or external URLs. The individual html-files are displayed in the main part of the **electure** course window. The files may thus be viewed as sections and subsections like in a traditional book, however with all the properties of hypertext.

Another approach would be to provide a web-like structure by connecting html- and other documents freely, without referring to the provided method of "internal links" and "last-next".

So all possibilities of html-documents are open. One may include images, movies, sound and other items. In case you include links to files, which are not representable by a standard browser, you should

instruct your students how to download and install the necessary browser-plugins, external viewers or other applications.

The lecturer's contents area provides the basic material for the course in the sense of a living text book. Unless forbidden by the lecturer, all logged-in students may add public notes to each one of theses text frames.

Extra features available from the contents html-files are exercises. They are prepared again as html-files, where a few new commands organize the question-answer scenario. An "exercise" has a text part, a question part and an answer part. It is up to the lecturer, how this is used. One way is to suggest multiple-choice "questions", where the question part really is a list of alternative answers. Another way is to ask open questions and leave it to the student to answer or to find out the answer before or after clicking the button. The exercises have the task of self-examination and there is no grading rule built into the system right now.

The meeting place

This is the communication and collaboration area. Organized by the course administrator the students may join working- and discussion groups. In a "Post Office" they may send mail to the group fellows. The mailing addresses used are standard e-mail addresses. Thus the handling of the mail may be done with the user's favorite browser. The "Post Office" just facilitates the address handling within the course.

There is a general "Discussion Forum" open for all course users. There main topical threads may be opened by everyone and subtopics, comments etc. may be added up to level depth 10. Only the course administrator may remove the postings.

For group collaboration there is a userspace "File Depot". It is accessed in a filebrowser-like fashion and allows the users to create individual (protected) folders, upload and download files (deposited by their group's peers), and to publish certain files to be available for all course users. This is in particular apt for group-projects.

There is a (for users of the course) public *chatroom* "Cafe". It is a simple version and there exist many more sophisticated chatroom-clients publicly available. Try this version and if it is not convenient enough, link from your course pages to some other chatroom in the public domain.

Some features (like the *whiteboard* - it is little used in practice) we did not include for various reasons (among them manpower).

Extra menu items and the search feature

You may include special links in the main menu line. An example of such a button is provided by the "Man Page", which was used in a UNIX-course to allow the student a quick access to the UNIX-man-pages. This way such menu buttons may link to dedicated applications provided by the course author or third parties. Possible applications in science include visualization tools (e.g. for molecular modeling) or computer algebra interfaces.

Finally, unless opted out, the search field allows all users to search for occurrences of strings in parts of the contents area, as defined by the course administrator.

Scenarios to run your course

Based on these tools you may decide for very different ways to support your course

Mainly contents

Use **electure** mainly as an open distribution platform for course material. In this case you may switch off user login completely and allow access to everyone, like for a homepage. The users then will not have to log in, but they also cannot add notes to the course items. Also the Meeting Place should be disabled in that case.

User login + Contents

Users have to login for access to the course pages (only a few administrative or introductory pages are generally open) and the can also add publicly readable notes to all frames. The course admin has the possibility to check on the user activities via the user statistics tools in the admin area.

User login + Contents + Meeting Place

The lecturer organizes the students in groups of e.g. 3-5 persons each. Each group is assigned to a group home folder in the userspace area. Each user may also add comments to the discussion forum.

Mainly Meeting Place

Cooperative learning may be the objective for this solution. Use the interaction features for communication with and among the students, organized in groups. Material still may be placed into the contents part, but otherwise it just serves as the entrance point to the course.

Depending on your demands, intermediate versions are possible. You may switch off only the discussion forum, or the file depot, or the possibility to comment on the main frames etc. etc.

Administration

As soon as your course is installed and initialized, you may call the administration interface through the URL

```
http://your.webserver.address/~yourid/MyCourse/admin/
```

where `MyCourse` denotes the name you have give to the course. As lecturer (course admin, course author) you have access to the administration interface through your admin password, which you have already specified in the file *inc/general_vars.inc.php*. This uid/password combination may be changed at any time *without* the necessity to repeat the installation.

Outside users access the course through the URL

```
http://your.webserver.address/~yourid/MyCourse
```

and may visit those course units, which need no individual login. For your students you have to specify userids and passwords which can be done via the administration interface. There is an application request form available for the students through the login menu. When completed the information is sent to the course administrator's e-mail address. As course administrator you may then quickly sign up the student by clicking at the URL provided in that e-mail.

Students may then login individually and thus have access to all course material prepared by you.

Your first step should be to create a standard user account for yourself. This will allow you to check out the course as a standard user.

In the administration interface you may

- Administrate users, groups and folders of the Filedepot (add, update, remove users and groups, send mail, check access statistics etc.).
- Insert or update Exercises.
- Inspect and remove user contributed notes, forum contributions etc.
- Combine several html-files of your course's contents part for printing of lecture notes.
- Get information on how to access the SQL data base.

All user and group data, exercises, information on files and folders and other details are put into an MySQL data base. Direct access to this data base is usually not necessary, but sometimes useful. We suggest to use the package *mysqladmin* for that purpose. More information may be found in the corresponding link in the admin area.

The access to the forum and to the userspace/Filedepot has course administrator rights, when called from the admin area. You may then delete topical threads in the discussion forum and adjust (delete, move, copy) all files and folders in the userspace/Filedepot.

All variables, which you have set, added, removed or modified in the file *inc/general_vars.inc.php* may be changed at any time. There are only two sensitive entries, where such a change has to accompanied by secondary actions:

> (a) Changes to the course owner name and password in the SQL data base should be followed by such changes in the data base. Consult the MySQL information pages or your SysAdmin, if this becomes necessary.
>
> (b) Changes that affect the images files (like menu-buttons, titles images etc.) that have been generated during the initial setup process. Such a change has to be followed by calling again the installation script *install.html* from your the web browser.

Users, groups and folders

Setting up users and groups

In the login menu interested persons may apply to become users of the course. The application details are sent to the course administrator's e-mail address. In that mail a link to a half-automatic installation of a user is provided. Clicking unto that link brings the course admin to the user installation page in the admin area.

The explicit way is to change explicitly to the admin area (remember: extra "`admin/`" at the end of the course URL). From the admin area you may install users and groups. You may give each user a homefolder or you may give all users of a group the same group home folder to share. You may also have an index file added to the group's or user's homefolders (see below the discussion of the Filedepot)..

In case you want to encourage project-oriented, collaborative learning you should arrange student groups of 3-5 members. Then, before "creating" these users, it is advisable to proceed as follows:

1. In the admin Filedepot-View create groupfolders (e.g. group1, group2 etc.).
2. In the group administration page created the groups (without members)
3. When creating the users, assign them to their corresponding groups and give them the group

folder as home folder (which therefore will be shared by all group members).
4. Only for the first member of each group activate the "add index" boxes, this will then create an `index.html` which will be referred to by a link in an automatically generated file "User contributions".

Do not worry, if you missed that procedure. Everything can also be correctly adjusted by individual changes through various admin menus. This was just a "streamlined" version.

Forum

The course administrator as well as every user of the course may create new topics threads to the forum. Each topic then may have comments opening subtopic threads and so one, down to 10 levels. Only the course admin may delete topics entries. In that case also the comments and subcomments to that thread are deleted. The course administrator usually will therefore provide a few main threads and suggest to the users to work below that level.

Userspace: Filedepot

The Filedepot rootfolder may be accessed only by the course administrator through the link in the admin area

The group folders may be created by the course administrator, who also defines the group members. During the installation of new users they may be joined to existing groups. They also may become joint owners of group folders. Alternatively they may get individual home folders.

Users may work only in folders, which are their home or which have been created by them. Thus, in case of a joint home for several members of a group, these have access to all files in their joint home but only individual access to the subfolders created by the individual user.

During user installation (or by updating user information) the course administrator may copy template files to files "`index.html`" in the group- or user-folders. The template file itself is *modules/filedepot/template-index-in-userfolder.html*. These index files are automatically linked to in a general Filedepot "User contributions" file. This allows users or groups to publish some of their private files for other users: They just link to them in their index files.

Ownership and permissions are organized as follows:

- Users' homefolders are defined by the course administrator and cannot be deleted, copied, moved, zipped, or tared by the users, even if they are owners.
- Folders can have one ore more owners.
- The files within a folder belong to all owner(s) of the folder; the folders belong to the respective creator, unless the ownership is changed by the course administrator.
- Only owners of files and folders have access (read, copy, move, write, delete) to those.
- Subfolders within a folder may have individual owners, if created by them. In this case other owners of the parent folder cannot access the subfolder (and cannot delete it).
- When creating folder hierarchies (folder and subfolders etc.) with copy, untar or unzip then the ownership of the creator is inherited.
- When a folder is moved, all ownerships of subfolders are unchanged.
- Files with extensions like *php* or *php4* cannot be created (for security reasons, see the section on security).

The Filedepot is owned by the course administrator who has access to all folders and files in it through the `Filedepot` feature in the administration area. If the administrator tries to create files outside the

Filedepot these will be created in the Filedepot rootfolder. (See also the remarks in the section on security.)

Backup

It is useful and advisable to keep backup copies of files in `userspace/Filedepot` and of your lecture material in the folder `contents`. For `contents` just save a tar-archive copy with, e.g., the command

```
tar czf contents.tgz contents
```

in the course home and move the resulting backup-copy `contents.tgz` to a save place. However, this way is not possible for the folder `userspace/Filedepot`.

Since `userspace/Filedepot` belongs to the web server, it will not be included in a tar-archive of your course, but you will get an error message in such an attempt. There are two methods to deal with that

- (a) You have root privileges on the webserver; than you can create the archive as usual.
- (b) You do not have root privileges, but are the course administrator. Then, using the filedepot-page (from the admin-area), you can tar and zip the relevant group folders (choose "tar and zip ") with all their contents and copy it via "download " (mouse menu) to another appropriate place under your control.

Export of user data

In the "List of users" window you may export all user data with help of the *"Produce a data file for exporting to other programs"* link at the bottom. Activating this produces a page with instructions, how to proceed.

Alternatively, on the webserver you may use the utility `mysqldump` *databasename users* (cf. the man pages).

Structure of your online course

The course is located in a directory under the lecturer's web home called here `MyCourse`

This directory contains the folders:

Folder	contains	originator
`MyCourse`	Web home of the course	electure
`MyCourse/admin`	Administration files for the course	electure
`MyCourse/contents`	The content-pages for the course; all material should be placed in that folder and possible subfolders (like e.g. *imglocal* for local images etc.)	lecturer
`MyCourse/css`	css-files (font styles)	electure
`MyCourse/doc`	Local copy of documentation for the lecturer	electure

MyCourse/help_en	Subfolder for the user help files, accessed via the help-button in the menu bar; the folder name is defined in the general variables file inc/general_vars.inc.php and folders for other languages may be built and used instead.	electure
MyCourse/img	Some image files	electure
MyCourse/inc	Necessary include files	electure and lecturer
MyCourse/install	Installation folder; needed for initial setup, later use only for the CourseAdmin to change images or other setup features (can be closed to the general webserver access after installation).	electure
MyCourse/modules	Subfolder modules of the course, that may or may not be activated.	electure
MyCourse/modules/cafe	Scripts for the (for all course users public) chatroom "Cafe".	electure
MyCourse/modules/filedepot	Scripts for the userspace "Filedepot".	electure
MyCourse/modules/filedepot/userspace	There the upload/download- and working space for the users "Filedepot" is located. Beware: The subfolders are property of the owner of the web server process (e.g. wwwuser/nogroup).	electure
MyCourse/modules/forum	Scripts for the discussion forum.	electure
MyCourse/modules/makeimages	Scripts for the installation step to create the course title image, menubuttons and other images.	electure
MyCourse/modules/notes	Scripts that provide the "notes feature", i.e. that the user may add notes to the contents items.	electure
MyCourse/modules/postoffice	Scripts for sending mail to course users and groups.	electure
MyCourse/modules/search	Subfolder containing the configuration file, templates and data base for the search feature.	electure
MyCourse/scripts	Folder for the php-scripts running the course	electure

The layout of the course's WWW-surface is defined by parameters in

MyCourse/inc/general_vars.inc.php

There you may change headers (color, text) and menu, as well as some of the graphic items used.

The course material is build from html-pages provided by the lecturer in the folder `MyCourse/contents`. This is really the only folder, where you have to work after your course has been setup completely.

Note regarding links

Internal links to html-pages via INLINK will be interpreted as URLs relative to that directory `MyCourse/contents`.

> *example:*
>
> [INLINK=CP-1-2-300.html TEXT=Introduction]
>
> refers to a file `CP-1-2-300.html` located in the folder `MyCourse/contents`.

Other explicit links not using INLINK (like the EXLINK-tag, the "A HREF"-command or the "IMG"-tag referring to images or movies) should be given as absolute URLs like

> `Coursehome/contents/imglocal/sample.gif`
> (e.g. `/~xyz/MyCourse/contents/imglocal/sample.gif`)

or in the form

> `../contents/imglocal/sample.gif`

i.e. with a preceding "`../contents/`" and then the path relative to the folder `contents`.

> *example:*
>
> <IMG SRC="../contents/imglocal/mypic.gif">
>
> or
>
> <IMG SRC="/~xyz/MyCourse/contents/imglocal/mypic.gif">

Text style

Text attributes of the various environment are controlled by the files in `MyCourse/css`. You may change that file, but be aware that the administration styles better be kept untouched.

The html-Files may be developed individually as standard html-code. When displayed in the course window only the information between the tags <body> and </body> is used.

For the filenames please use only characters and the symbols minus (-), underline (_) and dot (.), otherwise you may run into problems at execution time.

Dedicated files

There are a few files, which should be kept, but can be adjusted (names and content) to the lecturer's needs. These files are:

```
contents/motd.html
contents/newlogin.html
```

`modules/filedepot/template-index-in-userfolder.html`

and you find more information in How to prepare the online course units.

Language

The language in the course administrators area is English. However, all language specific strings and text files for the course users may be customized.

- The help files are in the folder `help_xx` (xx denotes the language, e.g. _en for English). The name of the folder is specifies in the file `MyCourse/inc/general_vars.inc.php`.
- The text strings in buttons and messages are defined in `inc/locale_xx.inc.php` (xx denotes the language, e.g. en for English). You may set up your own version. The name of the folder is specifies in the file `MyCourse/inc/general_vars.inc.php`. If the text in the button-images are to be changed, you have to invoke the installations script `install/install.html` again, but may restrict yourself to the generation of images part.
- The files `motd.html, newlogin.html, template-index-in-userfolder.html` in the folder `contents` may also be adapted to your needs.
- For the htDig search feature: the configuration and template files (with the string "_en") in the folder `search` ("_xx" denotes the language, e.g. _en for English). There is a README file in that folder, explaining the necessary changes.

How to prepare the online course units

You may supply arbitrary html-documents with embedded images and other features. For the lecture units the system will use only the code between the <body> and </body> tags. The default font and background color is defined in variables valid for the whole course.

Definition of the main text html-files

For an ordering structure of the content part, the html-texts may contain the following macros, which **electure** replaces in the final display by corresponding items:

[LASTREF=linkprevious NEXT=linknext]

> sample : [LASTREF=U-1-2-000.html NEXT=U-1-4-000.html]
>
> This command is obligatory (if you want an ordered sequence of course frames) and should be the first command in the visible html-text (i.e. between the <body> and >/body> tags). In the display this produces links to the preceding and following units as defined by the lecturer. The file names refer to files in the folder `MyCourse/contents`.

[EXLINK=external_link_URL TEXT=some_text]

> sample: [EXLINK=http://www.someone.com/grandpage.html TEXT=Check that wonderful page]
>
> In the displayed text there will be a link to the external html-page with the given text. On activation the link is opened in a separate non-course window. All external links should be done in this way in order not to violate copyrights.

[INLINK=localfile.html TEXT=some_text]

example: [INLINK=U-3-5-001.html TEXT=Sect. 3.5, further material]

In the displayed text there will be a link to the local course-material-html-page with the given text.

Internal links to html-pages via INLINK will be interpreted as URLs relative to that directory `MyCourse/contents`.

Other explicit links not using INLINK (like the EXLINK-tag, the "A HREF"-command or the "IMG"-tag referring to images or movies) should be given as absolute URLs like

```
Coursehome/contents/imglocal/sample.gif
(e.g. /~xyz/MyCourse/contents/imglocal/sample.gif)
```

or in the form

```
../contents/imglocal/sample.gif
```

i.e. with a preceding "../contents/" and then the path relative to the folder contents.

example:

<IMG SRC="../contents/imglocal/mypic.gif">

or

<IMG SRC="/~xyz/MyCourse/contents/imglocal/mypic.gif">

[EXERCISE=localexercise.html TEXT=some_text]

example: [EXERCISE=U-3-5-003-A-3.html TEXT=Exercise 3.5.3.A.3]

In the displayed text there will be a link to the exercise-page with the given text. The html-file should be in the folder *contents* or its address should be given relative to that folder. On activation a separate exercise-window opens, giving questions and answers as specified in the page localexercise.html (definitions see below).

Definition of the exercise text html-files

The exercise should be ready as an html-file with the format:

Exercise x.x.x.

General text of the exercise.

[Question] Question or suggested answer

[Answer] Answer or explanation to that question

This sequence [Question]...[Answer]... may be repeated several times.

In the answers you may embed further Exercises (as usual: [EXERCISE=... TEXT=...]); you may not use the features [INLINK...] and [EXLINK...].

Whenever this exercise-file is ready (and access is allowed from the active server by suitably adding the read-flags to the file) you should insert the exercise in the course's data base via the link in the main lecturer's menu.

A complete update of the exercise is implied if you insert it again (with identical file name) .

The exercise is displayed in the left-hand part of a separate window. The multiple choice type solutions ([Answer]-fields) are randomly listed. When the student chooses one of these answers, there is a delay (default duration of 3 seconds, but the lecturer may change this parameter) before the answer file is displayed. There is no inbuilt grading of the answers, but the lecturer may introduce grading based on the protocol in the courses data base, which lists all entries and page accesses.

Secondary (e.g. images) files

Put the file in some folder of your choice (e.g. in $MYCOURSE/contents/imglocal; if you put it into $MYCOURSE/img, your images will be mixed with the standard course images, which is not advisable).

Dedicated files

Depending on the menu-entries, that the lecturer has defined, there may be need for further html-files like FrequentlyAskedQuestions.html, TableOfContents.html etc.

At the time of first installation there are a few obligatory files, which should be kept there, but can be adjusted (name, location and content) to the lecturer's needs. These files are:

`contents/motd.html`

> contains a brief "message of the day" by the lecturer, which is displayed throughout the student session (in a separate frame). This is a standard html-file, processed like the other units, however without any of the special commands discussed above. It should not have any links but may, however, contain images. Since it is displayed in a small area, it should be short. The "message of the day" may e.g. indicate information of new items, extra mail by the lecturer, date and schedule of exams (or your favorite photo of the day). If this file does not exist the corresponding field in the left-hand frame remains empty.

`contents/newlogin.html`

Optional additional information (added to the login page) for new users who want to apply for a login id

`modules/filedepot/template-index-in-userfolder.html`
: A template file for the file `index.html` in the user homefolders. Via this file the users may make files available to other course users.

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4. Security

Security

The following notes are just for your information. Experienced administrators may use them to try to improve on the security. If you have a good idea, tell the authors!

This system if not Fort Knox and we assume that the users are not malicious. However, the best situation is when the webserver hosts next to the course only friendly (trustworthy) users. We collect here some positive and some problematic aspects.

Starting with PHP 4.2.0 the variable Register_Globals has been set to the value *register_globals=Off* as the default value in the initialization file /etc/php.ini. The installation and all scripts with **electure** now are compatible with both settings. Note that security is improved with this new default.

We *one-way encrypt the course users passwords*; the initial password is given during user installation but may be be changed by the user later on. Only the encrypted password enters the data base.

Whenever a user logs in *a cookie is set*. The lifetime of the cookie may be defined in the general variables file, however, usually one suggests at least several days (default: one year). This has the advantage, that the user does not have to login again for every access of the course. We assume single user configuration files at the respective user webbrowsers. The cookie is encrypted specifically such that another user may not fake it (except by stealing the cookie).

The data base password is in the file `inc/general_variable_inc.php`. It has to be readable by the web server. Thus on some installations it may be readable by other users (See comment on friendly co-users above. Extended ACLs may be helpful in this respect...)

The `modules/filedepot/userspace/Filedepot` has to be owned (rwx-permission) *by the web server*. Malicious co-users of the web server may trick the server to manipulate files and folders according to their wishes. Therefore in the file `modules/filedepot/userspace/Filedepot/localinc/filedepot_vars.inc.php` a list of forbidden filetypes (in particular `php`, `php3` and `php4`) has been introduced. Upload of such files, as well as copying, renaming and unzipping to such filetypes is forbidden and the files will not be created. Depending on the webserver configuration the course administrator may want to add further extensions to the list (like `cgi`)

One could tighten the security by giving the rx-permission (better: ownership) of the further folders of the course (in particular the folders *install, scripts*, *admin* and *inc*) to the web server alone. This would hinder the lecturer at the beginning, but once the course parameters are not changed anymore, it should not be too big a burden. Such a solution may be feasible if the course owner owns the web

server.

Note: The files within the users' filedepot are owned by the webserver and can be called directly from the "outside" by using the correct URLs. They are not limited to access for administrator or course users only. This appears to be no problem - but the users should be made aware.

So the security and protection of e.g. files in the Filedepot is limited. On the other hand, an e-education platform is no place to deposit sensitive and confidential data.

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5. Frequently Asked Questions

Frequently Asked Questions

- **Question:** In the installation process I get an error message like

  ```
  Sorry, but GD library is not loaded into this php-build.
  ```

  Answer: Your PHP-library has been compiled without necessary extensions.

  Most Linux-distributions are delivered with precompiled archives (*.deb, .rpm*) where all necessary libraries are included. For nice title images **electure** requires at least the libraries gd (http://www.boutell.com/gd/) and either TrueTypeFont-Support (ttf) (http://www.freetype.org) or Postscript Type 1 support (pfb, "t1lib").

  Here is a link to man-pages on images in PHP and the necessary tools.

  (You may live without the libraries and have the title images generated by the web server; this may be achieved by a corresponding flag in the file `general_vars.inc.php` , but the title does not look as nice.)

  The script `install.html` (and its sequels) will check if the graphics libraries and fonts are supported by your php-interpreter. The php-interpreter should have been compiled with the options

  ```
  ./configure --with-gd --with-ttf --with-mysql
  ```

  In case it has been compiled without the option "`--with-ttf`", i.e. without ttf-support (TrueTypeFont) it should have Postscript Type 1 (pfb) font ("t1lib") support. The setup script will then suggest the fonttype you should use for the title image. For further documentation see http://www.php.net

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- **Question:** How can I include calls to other scripts or programs, that return web pages (e.g. some

interactive form or similar)?

Answer: The file `contents/man.php` provides an example of how to include calls to e.g. UNIX-shells into your course menu. You may remove it or replace it by other features like a call to some external programs. In order to do this you should have some experience with dynamic creation of web pages.

- **Question:** How can I change the color of the pre-installed title image?

Answer: This is done through the variables `$Hue` and `$Saturation` in the configuration file `inc/general_vars.inc.php`. A value of `$Hue=0.5` gives you an aquamarine type color, whereas 1 gives red. A combination of `$Hue=0` and `$Saturation= 1` gives a blue/red combination. Just experiment!

- **Question:** Are there other title images? Can I use a title background of my own design?

Answer: In the subfolder `modules/makeimages/localimg/headersamples` we have put a small collection of other background images. They all have the standard width 790 and the height 90 and are PNG-files. You may also use such an image of your own design! You may change both, the standard title background (if you do not generate images) or the custom title background (if you generate images) by changing the corresponding filename in the file `inc/general_variables.inc.php` or `modules/makeimages/localinc/makeimages.inc.php`, respectively. When you have activated image generation then you should repeat the installation process by calling (from your browser) the script *install/install.html*. Since all variables are unchanged, you should skip the data base installation part and just repeat the part "Customization of images".

- **Question:** I am running more than one course under **electure** . What database ownership should I choose?

Answer: Well, you may decide for new owner names and passwords for each of your courses. If you want to have only one common ownerid, *then also the password has to be the same*. The database owner and password for the respective courses are defined in `inc/general_vars.inc.php` as variables.

- **Question:** My Course is called "C+P" and I also use that name for the data base entry. After setup, when MySQL-Root should install the course's database, one gets an error message?

Answer: Please use only characters for the *name of the database*. Changing the data base name to "CP" should work. The course name can still be C+P.

- **Question:** Somehow a foldername including a blank was entered in the userspace/Filedepot. Can I just remove it?

Answer: Yes, as course administrator (and calling Filedepot from the course admin area) you can just remove it. Its corresponding entry in the list of folders should then also disappear. You can check that in the folder list menu.

If something went wrong (and this then most likely is a bug in the electure -system!) and filenames including strange symbols appear, only a brute force approach works. With root privileges you can enter the Filedepot and change or remove the filename. As course admin you can - with help of e.g. *mysqladmin* - also change directly entries in the course's data base. But this should be done only as a last resort.

- **Question:** A user complains: I cannot log on to the course, although I am using the correct userid/password!

Answer: Sometimes a reason for that may be old cookies from earlier visits to an older version of the course, where the user had the same userid. At each visit the user's browser is asked to deposit a so-called cookie in her or his cookie-list. The electure-system asks at further visits for that cookie and, if successful, identifies the user, such that she/he does not have to enter the login-details. The expiration date of the cookie may be defined by the course author (in the file `inc/general_vars_inc.php`) and its default is one year. Thus in some situations the old cookie may interfere with the new login.

Solution: The user should remove the cookie for the course from her/his list of cookies. Then it should work. Alternatively the course author could set a short expiration period for cookies - this however might imply some inconvenience for the users, who than have to log on with userid/password more often.

Also: make sure that the user has enabled *Javascript* for her/his browser!

- **Question:** How can I change the language of the course?

Answer: Well, your contents text files can be changed only by having them translated. The electure-specific strings in the user part of the course, however, can be changed by adjusting some variables in `inc/general_vars_inc.php`. For English ("_en") and German ("_ge") the necessary files and templates are part of this electure distribution. Just check the file `inc/general_vars_inc.php` and consult the description "Structure of your online course" where you find information, which files to change.

- **Question:** How can I export the user data to a format readable by data base programs?

Answer: This can be done from the "List of users" window. A link at the bottom of that page entitled *"Produce a data file for exporting to other programs"* produces a page with instructions how to proceed. Alternatively, you may log on to the web server and use the routine `mysqldump` (check the man pages!).

- **Question:** How can I analyze the students trace through the course in more detail? Can I somehow evaluate the answers given in the exercises?

Answer: When user tracking is activated (default for login required) all students activities are traced (in the SQL data base tables URI-internal and URI-external) when in the contents part. There is a summary statistics page available via the admin area; from that page one may also get a complete trace for individuals. However, analysis in more detail is not provided. In case you know how to deal with SQL and possibly PHP you may add your own analysis scripts. However, the exercises are mainly thought as self-control for the students. Nobody likes to be looked over the shoulder when learning. Usually it is better to use dedicated tools for real-time examinations.

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6. License information
