Learning *Online* Network with CAPA

Course Management Manual

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1 Managing the Class List

1.1 Class List Management

To modify the class list you must be the Course Coordinator for that class.

1. On the remote select the **ENRL** (course enroll) button.
2. In the main browser window you will see a text box directly below the subheading, **Upload a courselist**. Type the path to the file that contains the class list, or click **Browse** and locate the file on your machine.
3. Select the appropriate file type from the drop-down menu (usually **CSV spreadsheet**) and click, **Upload Courselist**. To see how to generate a CSV file, see 1.2.
4. The next screen allows you to associate the uploaded spreadsheet's columns with the necessary student fields, such as: **Last Name**, **First Name**, etc. Use the drop-down menus to make an association for each of the spreadsheets' columns.

   Note: If you wish to associate a particular column to more than one field (if, for example, you wish to make the students' initial passwords the same as their student numbers) click the button labeled, **Reverse Association**. Then you can assign columns of the spreadsheet to more than one field.
5. From this page you can also set the login type and the start/end dates for the students.
6. Once you have the enrollment information set click, **Update Courselist** to complete the transaction.

1.1.1 Add a Student

To modify the class list you must be the Course Coordinator for that class.

1. Logon to the network. If you have multiple roles, click ROLES on the remote and SELECT Course Coordinator for your particular class.
2. On the remote select the **ENRL** (course enroll) button.
3. In the main browser window click the button labeled, "Enroll Student".
4. Enter the relevant student information, login type, and set the start/end dates for the student.
5. Click "Enroll as Student" to complete the process.

1.1.2 Drop a Student

To modify the class list you must be the Course Coordinator for that class.

1. Logon to the network. If you have multiple roles, click **ROLES** on the remote and **SELECT** Course Coordinator for the particular class.
2. On the remote select **ENRL** (course enroll).
3. Near the bottom of the main browser window you will see a subheading called **Drop Students**. Click **Selection List**.
4. Next you will see the list of students your course has been assigned to. Click the boxes next to the names of the students you wish to drop.
5. Click **Drop Students** at the bottom of the page to complete the drop.

1.2 Converting to CSV

To upload an Excel spreadsheet into LON-CAPA you must convert the Excel spreadsheet into a *Comma Separated Value* file, as follows:

1. Open the spreadsheet in Excel.
2. Choose **File**, and from that menu **Save As...**.
3. Select "**CSV (Comma delimited)(*.csv)**" from the "**Save as type:**" drop-down menu, *remembering where you saved it.*
4. Click "**Save**".
5. Click "**Ok**", or "**Yes**" for any windows that may appear, to create the *.csv file.

You can then upload the CSV file generated, as described in 1.1.

Other spreadsheet programs can also export CSV files. Many of them follow procedure very similar to Excel's. Consult your spreadsheet program's documentation for more information.

1.3 Course Chart to Excel

You can get the information from the chart into Excel or similar spreadsheets by cutting and pasting the chart into a file on your machine. You can then import that file into Excel, though it will take some tweaking of the import parameters to get it to work correctly.

1.4 Modifying Student Data

To modify student data the user must be the Course Coordinator for the course.

1. At the **User Roles** screen, select the role **Course Coordinator** for the desired course.
2. Clink **ENRL** on the remote control.
3. At the **Enrollment Manager** screen, click the **Modify Student Data** link. The screen will then display the current class list. (The user may also use the pull down menu to display previously enrolled or any enrollment status for the class.)
4. Select a username to modify the student's information. The screen will display the student name and data.
5. Modify the student data.
6. Click **Submit Modification**.

2 Course Document Screen

Management of a LON-CAPA course is managed through the Course Documents screen, accessed by pressing the **DOCS** button on the remote. This screen allows you to arrange LON-CAPA resources from the LON-CAPA network, and create several resources for use in your course.

Main Course Documents are the ones the student will use the navigation controls to move through, and make up the course itself. Main Course documents show up on the Navigation Maps screen. Main Course Documents was added to LON-CAPA in 2003, so courses pre-dating 2003, or deliberately created in the old style by the Domain Coordinator will not have Main Course Documents.

Supplemental Course Documents are attached to the course, but do not appear in the main course sequence. Students access these documents by hitting the **DOCS** button on their remote. Supplemental Course Documents are particularly useful for auxiliary files that may not be directly viewable or usable in a browser, such as Powerpoint presentations or Word documents, which may not work on all student's computers.

Manipulating the two types of Course Documents are essentially identical, except that the Main Course Documents has some options which are not available in the Supplemental Documents, as they do not make sense there.

Note: These capabilities are provided to allow instructors to extend already existing courses, or personalize courses with their own syllabuses or information pages. Main Course Documents and Supplemental Course documents do not carry over from one course to another. If you would like to create documents that can be used in multiple courses, please talk to your LON-CAPA Domain Coordinator about becoming an Author, which will open the full power of the Author role to you. For more information about what that means, see the

LON-CAPA Author's Manual. It is available online in the **About LON-CAPA Help and More Help** link at the bottom of this page, if you are viewing this online, or at http://*your LON-CAPA server*/adm/help/abouthelp.html, where "*your LON-CAPA server*" is replaced by the hostname you use to access your server, such as "loncapa.msu.edu".

2.1 Main Course Documents

Main Course Documents are the "top-level" documents of your course. They are the documents the the user will use the navigation controls to move through, and makeup the course itself. When a user enters the course they will be taken to the first resource listed in the main course documents, and as they proceed forward through the course, they will proceed towards the last resource. Main Course documents also show up on the Navigate Course Content screen. Manipulating main course documents and supplemental course documents is essentially identical, except that main course documents has some options that is not available in the supplemental documents. Changes made to the main course documents, such as adding new resources, changing the order, renaming or removing resources will be visible the next time you log in, or by clicking the re-initializing button on the course document screen, whichever comes first.

Note: Main Course Documents and Supplemental Course Documents do not carry over from one course to another. If you would like to create documents that can be used in multiple courses, please ask your LON-CAPA Domain Coordinator about becoming an Author.

To add Course content, log in to the course you want to add content to. On the remote control, click **DOCS** to display the **Course Document** screen.

There are four ways you can add a new document to the course:

- Upload a document from your harddrive such as Powerpoint presentations or PDF files (2.2),
- Import a document from the LON-CAPA network (2.3),
- Add an external resource (2.5), or
- Create a document from a prepared template (2.6).

You can also organize documents into folders for structure, (2.7) or add a **Navigate Content** page, which creates a resource in the course that displays the Navigation Course Content screen.What is Navigate Course Content screen? This could make a good first page for a course.

The resources are listed in the order they will be viewed. The first resource listed is the starting page a user will see when they access the course. To change the order of the resources, click on the blue up or down arrows next to resource you wish to move. Repeat this until you have all the resources in the order you want. You can also **Remove** or **Rename** a resource by clicking on the blue word next to the resource. Changes made to the course documents, such as changing the order, adding new resources, renaming or removing resources will be visible the next time you log in, or by clicking the **re-initializing course** button on the course document screen, whichever comes first.

2.2 Uploading a Document From Your Harddrive

Any file you can create on your harddrive can be uploaded into your course, such as Powerpoint presentations or PDF files.

To upload a file from your hard drive into the course, do the following:

- Create the document, and save it to your hard drive.
- Log in to the course you want to add content to.
- Click **DOCS** on the remote control.
- In the **Upload a new main course document** or **Upload a new supplement course document** area, either type the path to your document or click the **Browse...** button to find it on your hard drive.
- Type the title in the Title text box.
- Click Upload Document.

Note: Your new file will be visible the next time you log in, or by clicking the **re-initializing course** button on the course document screen, whichever comes first.

2.3 Importing a LON-CAPA Resource

Any resource from the LON-CAPA network that you have permission to use can be imported into your course documents.

You must be the course coordinator to import resources into your course. Any resource from the LON-CAPA network can be imported into your course documents. To import a resource, do the following:

- At the **User Roles** screen, select the role **Course Coordinator**.
- Click **DOCS** on the remote control.
- At the **Course Documents** screen, click the **Import** button in the **Import a Published Document** area.
- The **Browse Resources** screen will open with a view of the LON-CAPA network. Navigate to find the desired resource.

  Note: If you don't know exactly what resource you want, you can click **Search** to pull up the LON-CAPA search interface.

- Click the boxes next to the resources you want to import.
- Click **GROUP IMPORT** at the top of the screen. At this point you can re-arrange the order prior to insertion into the course document sequence, go back and collect more resources, or cancel the process.
- Click **FINISH IMPORT**, and the resources will be added into your course documents.

Note: Your new resources will be visible the next time you log in, or by clicking the re-initialize button on the course document screen, whichever comes first.

2.4 Loading Resource Into A Folder

You can load all the resources from an existing LON-CAPA sequence into the current folder in your **Course Documents** area. This allows you to easily load up a folder with existing resources, and subsequently manipulate the folder, such as by deleting or reordering the resources.

Note that if you have no intention of changing the order, it's easier just to directly load the sequence using the **Import** button.

Load a map's resources into the current folder by doing the following:

- Click **Select Map** next to the text entry area under the **Import a published document** area on the **Course Documents** screen.
- Navigate to the desired sequence, and click the **Select** button next to it.
- Click the **Load Map** button. The map will be loaded into your **Course Documents**.

2.5 Adding External Resources

Resources not included in the LON-CAPA content network can be added to the course by clicking the **External Resource** button on the Course Documents screen. A window will come up which will allow you to type the URL of the web resource you wish to add.

When you've typed a URL, click the **View** button to see it in the frame below the entry fields. Click the **Choose** button to choose this resource to add to your course, if it is the correct resource. If not, either correct the URL and try **View**ing it again, or click **Cancel** to not add any resource to the course at all.

The new resource will appear in the course next time you **Re-Initialize** the course on your **ROLES** screen, or login, whichever comes first.

2.6 Creating A Document From A Template

Several templates are available for you to fill out and add to your course.

To add a templated document to your course, click on the button for the templated page you wish to add: **Syllabus**, **Simple Page**, **Bulletin Board**, or **My Personal Info**.

Simple Page and **Bulletin Board** will pop up a window asking you to give them a title. Once you've titled the page, if necessary, the page will be added to the end of the current Course Documents folder.

The new document will appear in the course next time you **Re-Initialize** the course on your **ROLES** screen, or login, whichever comes first.

- **Syllabus** adds a traditional syllabus page, which can be filled out with various standard Syllabus information.

- **Simple Page** allows you to add a simple HTML page to the course, with an area for text, and an area to add web references. Give the page a **Title**, type plain text into the **Content** textbox, and add any links to other resources in the **Web References** section, where they will be turned into HTML links for the students. Simple Pages allow you to upload a graphic into them. On the editing screen, either type the path to the photo, or click the **Browse...** button to select the file to upload, and then click the **Upload** button.

- **Bulletin Board** allows you to add a dedicated Bulletin Board page to the course. By default in LON-CAPA, *all* pages can host discussion, but you may wish to centralize the discussion, or provide a place for general course-related discussion.

- **My Personal Info** will add your personal information page, which is the same across all LON-CAPA courses you may be an instructor for. This is a place to provide a general introduction to yourself for your students. My Personal Info will allow you to upload a photo into it. On the editing screen, either type the path to the photo, or click the **Browse...** button to select the file to upload, and then click the **Upload** button.

  Note: The **My Personal Info** page is a special page in that it belongs to you, not the course. Everywhere you insert that page will have the same contents, and all changes made to one will propogate to all others. Bear that in mind as you fill it in; since it may appear for multiple courses you may not wish to add course-specific information.

To edit templated pages, click on the page's link in the Course Documents area, next to the blue arrows, **Remove** and **Rename** link. Each template behaves in much the same way: Several labeled fields are provided, with text boxes below them. Fill out the ones that apply to your course. Leave the rest blank, and they will not be displayed to students. When you are done, click one of the **Store** buttons to save your work.

When you click **Store**, *all* changes made to any textbox on the screen are saved. Thus, you need not click **Store** for every single textbox; the **Store** buttons are shown next to each box for your convenience only.

To see how the page looks without the text boxes, click the **Public View** or **Show Student View** link near the top of the page. This will show you how the page looks to everyone else.

All of these document types are provided for your convenience; you are not required to use them. If for instance you prefered to create your own Syllabus, you can create an HTML page and either upload it into the course like any other document (see 2.2), or host it on another web server and add it as an External Resource (see 2.5).

2.7 Structuring Your Course With Folders

You can add folders to your **Course Document** screen to organize your course. Folders can act as sequences, chapters, modules, or homework sets. To add folders to your course, do the following:

- Log in to the course you wish to add folders to.
- Click **DOCS** on the remote control.
- At the **Course Documents** screen, click the **New Folder** button in the **Special documents** column.
- At the pop up window, type the name of the new folder and click OK.

  The folder will appear at the bottom of the course document area you added it to.
- To add resourses to the folder, click on the folder you created.

A new course document screen will open, but you should see that under the **Main Course Documents** label, there is a new label **Folder:**, followed by the folder name. The folder is currently empty. You can now add resourses to the folder, exactly as they are added in the "top-level" Course Documents area (2.1).

Note: Your new folders will be active the next time you log in, or by clicking the **re-initializing course** button on the course document screen, whichever comes first.

2.8 Navigate Content Page

A **Navigate Content** page will display the exact same page as the **NAV** button on the remote control. This page displays the resources in the Main Course Sequence. They are the documents the user will use the navigation controls to move through, and makeup the course itself. Putting a Navigate Content page allows you to place that screen on the sequence the students will see. Some instructors like to use this as the first page in the course.

2.9 Supplemental Course Docs

Supplemental Course Documents are auxiliary file the course coordinator wants the student to have access to that are not necessarily part of the course, such as reference material, hand-outs, ect. This is also useful for files that may not be directly viewable or usable in a browser, such as PowerPoint pesentations and word documents. Supplemental documents differ in how the material is presented to the student. The student will not see the supplemental documents unless they click DOCS on the remote control. Manipulating supplemental course documents is essentially identical to main course documents, except that main course documents has some options that is not available in the supplemental documents. Specifically, you cannot add a **Navigate Content** page, a **Simple Page**, or **Bulletin Board** since those should be in the course sequence. Like the Main Course Documents, you can still add a **New Folder** (2.7), add an **External Resource** (2.5), add a **Syllabus** (2.6), or add your **My Personal Info** page (2.6).

Changes made to supplemental course documents, such as adding new resources, changing the order, renaming or removing resources will be visible the next time you log in, or by clicking the **re-initializing course** button on the course document screen, whichever comes first.

Note: Main Course Documents and Supplemental Course Documents do not carry over from one course to another. If you would like to create documents that can be used in multiple courses, please ask you LON-CAPA Domain Coordinator about becoming an Author.

3 Course Communication System

You can access all messages using the **COM** button. Unread messages will be displayed to you immediately. In addition, on the **NAV** page, you see a letter symbol next to any resource for which you received unread feedback messages.

This chapter will focus both on how you will use the communication system, and the various ways the students can use the communication to communicate with you and the rest of the course personnel.

3.1 Critical Messages

A “Critical Message” is a message that will appear immediately after the recipient user logs in. The user must acknowledge receipt to continue; it is not possible to use the rest of LON-CAPA until they do so.

To send a Critical Message, push the **COM** button on the remote to get to the Communication screen. On each of the message sending screens (**Send message to user(s)**, **Broadcast message to course**, and **Upload message to course**), there are two checkboxes, **Send as critical message** and **Send as critical message and return receipt**.

Send as critical message will send this message as a critical message. **Send as critical message and return receipt** will send the message as a critical message, but additionally return a message to you each time a user acknowledges receipt of the message.

3.2 Making a Discussion Board

To create a place explicitly intended as a discussion area, the easiest thing to do is make a short HTML page, with contents set to something like *General Discussion Board: Please* *post general discussion here.* Then add that page as the first page of your course sequence, or wherever else you would like the general discussion page. LON-CAPA's built-in discussion features will do the rest.

This can be done by a course instructor through the **DOCs** screen; see section 2.6 for more information on how to do that.

You might also want to include information on that page about how to post to the discussion.

You can make as many of these discussion board areas as you like; for example, you might want to make one for each chapter or section.

3.3 Disabling Discussion

By default, all users of a course can use the discussion features LON-CAPA provides. Only Course Coordinators have permission to disable discussion for a course. A Course Coordinator can also disallow resource discussion for specific roles or specific users.

1. At the **User Role** screen, select the role of Course Coordinator for the course.
2. Click **PARM** on the remote control.
3. At the **Set Course Parameters** screen, click **Set Course Environment**.
4. Scroll down to **Disallow Resource Discussion for Roles** or **Disallow Discussion for User**.
5. To disallow resource discussion for specific roles, enter a comma-separated list of roles, for example: `st, ts`. This will disable course discussion for the specified roles. To disallow discussion for a specific user, enter `username:domain`.
6. Check the **Set** field if not checked.
7. Click **Set Course Environment**.

These changes take effect the next time affected users enter the course.

3.4 Course Calendar

A user can add an announcement to the calendar by clicking **CLDR** on the remote control. The Announcements and Calendar screen will open. Using the pull down menus click on the Starting time and the Ending time. Type the announcement in text box and click Post Announcement. The announcement will now appear on the specific date(s) on the calendar. Today's announcements will also show up on the Roles screen, next to the respective courses, and on the Course Syllabus page.

A user can remove an announcement from the calendar by clicking **CLDR** on the remote control. The Announcements and Calendar screen will open. Scroll down the screen to view the calendar shown on the screen. If the announcement is in the current month then check the box next to the announcement. If the announcement is not in the current month then use the **Previous Month** and **Next Month** links to move to the correct month. After the user has selected the announcement click Remove Checked Entries.

3.5 Recording Notes and Face-To-Face Communication

3.6 Course Chat

To use the course chat feature do the following:

1. Click **CHAT** on the remote control.
2. Type the message in the new window's text box.
3. Click **Post Anonymous** or **Post**.

Note: If the user chooses to post anonymously only the course faculty will see their name.

3.7 Course Evaluation

To submit an evaluation for a course, do the following:

1. Click **EVAL** on the remote control.
2. At the **Evaluate Resource** screen, answer the questions using the pull down menus.
3. Add comments if necessary in the comment field.
4. Click **Submit Evaluation**.

4 Course Parameters

As course coordinator, select **PARM** on the remote to set course parameters. From that screen, you can edit either edit the course environment, or the course parameters.

The course environment contains several parameters that apply directly to the course as a whole.

The other parameters in the course apply with varying granularities to the components of the course, such as maps, problems, and students.

You can display parameters for the entire course (top-level map) or just select the enclosing map. After the parameters display, you can choose to set parameters, due dates for example, on three levels:

1. Entire course - everything in the top-level sequence. Click on the bar "__" in any of the problems under the **general** heading.

2. Enclosing map. Click on the bar "__" in one of the problems in the enclosing map under **for Enclosing Map** heading.

3. One particular resource. Click on the bar "__" in the particular problem you want to set parameters for under the **for Resource** heading.

The last heading says **Parameter in Effect**. Under this heading is the actual parameter being used. The *most specific* parameter is what will be used for any given resource.

4.1 Feedback Adresses

In the Course Environment. Access the Course Environment through **PARM**, and then **Set Course Environment**.

For each Feedback type you can specify a comma separated list of "username:domain", for example, "fred:msu,susie:ohiou". Check **Set** next to the new entries, and store. The new settings will take effect when entering the course the next time.

4.2 Top-level Sequence

Every course points to one "top-level" sequence file. This sequence is specified by its URL when the course is first opened.

The sequence used as the "top-level" sequence can also be changed later using the **Course Environment** in the **PARM** screen. The danger in pointing to another sequence file in the middle of a running course is that homework performance data might be lost.

4.3 Problem Weight

The "problem weight" parameter is used to calculate the points of a problem. The default spreadsheet uses the weight as the points. You may want to think of a problem's weight in comparison to other problems. For example, all problems with a weight of 1 means that both easy and difficult problems are given the same weight. If you choose to customize the spreadsheet, then the problem weight and points may not equal each other for your course. The default weight of all problems and problem parts is 1.

5 Misc.

5.1 Student Grade Override

To override the grading of a problem of a problem for a particular student, **NAV**igate to the problem as the course coordinator (or instructor) and use the **PGRD** (Problem Grade) button on the remote. If the problem in question appears in a page, the **PGRD** button will be above the problem. Then, select the student that you want to override the grading for.

5.2 Homework Performance Overview

To get an overview of how well the students are performing their homework in a course, select the **Course Coordinator** or **Instructor** role for the course, and press the **CHRT** button in the remote.

The numbers indicate how many attempts it took that student to get the homework correct. The green numbers indicate the number of problems a student solved per sequence. The blue numbers indicate the total number of problems solved out of the total number of problems for the complete course.

5.3 On Deleting Courses

A course can not be "deleted" from a LON-CAPA server. Courses occupy very little storage space, and an inactive course is not a burden on the system. On the other hand, allowing data to be permanently deleted could lead to serious accidental data loss.

You *can* expire the roles for all users in the course. For example, when you use **ENRL** or **CUSR** to put students, instructors, or course coordinators into a course, you can set an ending date for those roles. When the ending date is reached, the role associated with the course will not be accessible to the user any more.

If you view the **ROLES** screen, you will see a checkbox at the top that allows you to display all roles. If you check that box and click the display button, you can see your current and expired roles, if any.

It is a good idea to get into the habit of setting end dates for all courses.

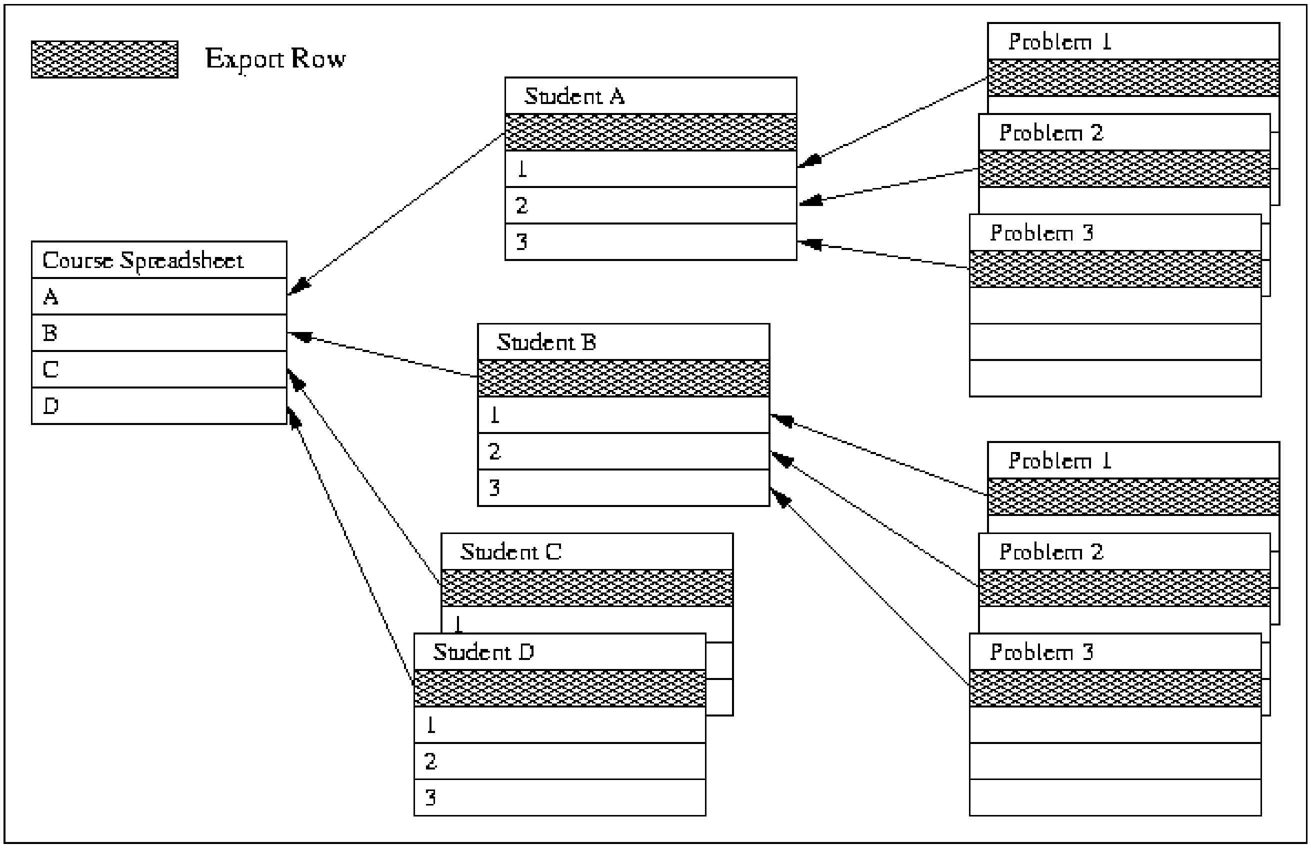
5.4 Viewing Student Problems

To see how a specific student did on a specific problem, or to view the correct answer for a given student and problem, **NAV**igate to the problem in question and hit **SUBM** (Submission). This will display a menu allowing you to choose a student. After you select the student of interest, LON-CAPA will show all previous submissions that the student made. For problems that are on pages, the **SUBM** button will not be on the remote control but above the actual problem. The **SUBM** function will also show the correct solution for that student, as well as a dump of all variable values if the problem has a script area.

6 Introduction to the Spreadsheet

The **Spreadsheet** is used to tell LON-CAPA how to determine how many points a student gets for the LON-CAPA portion of the course.

Spreadsheets are extremely flexible and powerful and can draw upon nearly all aspects of the data LON-CAPA stores about a student. Spreadsheets can be simple things that simply give one point per completed problem to a student, or powerful things that give bonus points for completing problems early or penalties for late completion,, completing problems on the



first try, differing values to different problems or problem parts, or just about anything else you could desire.

6.1 Spreadsheet Organization

The course spreadsheet has three levels.

The top-level is the "course level" sheet, which is not accessible to students. It lists the export rows of all "student level" sheets (the sheet that students get to see when they press "GRDS"). These in turn import the export rows of all assessment level sheets.

The figure shows the spreadsheet hierarchy.

In order to get data from the lower level spreadsheets to the higher level spreadsheets (see 6.1), the data must be exported from the lower-level spreadsheet.

The export row of assessment-level spreadsheets is what is exported to the student-level sheet.

The export row of student-level spreadsheets is what is exported to the course level sheet.

Only the columns labeled with uppercase letters will be exported. The lowercase letters are available for additional calculations used only on the current level of the spreadsheet.

The template row is a way to use the same formula in every row of a sheet. The actual row number is replaced by a "#". For example, "A#*b#" would be "A5*b5" in row 5.

7 Using the Spreadsheet

7.1 How the Spreadsheet Works

The spreadsheet determines which data it imports from the metadata of the resource. Additional imported values can be used in formulas through the same &EXT (external) function that is also available in assessments. For example, &EXT("system.time") imports the system time. (Note that in this particular example, the explicit time dependence is not recognized by the caching mechanism (see also 7.2).

In the assessment level spreadsheet, most imported values also have symbolic name attached to them, for example parameter_0_weight. You can refer to the imported value by adding square brackets around its name, for example [parameter_0_weight]*A5.

Problem weight is set on the **Parm** screen. The **weight** of the problem is a parameter that is attached to the problem that *can* be used by the spreadsheet to calculate the points a student will receive for a problem.

The default spreadsheet uses the "weight" parameter as the number of points a student will receive for completing a problem correctly. Custom spreadsheets can use many parameters to compute the points a student will receive, such as *status* (completed, not solved, excused, etc.), *partial credit*, *number of tries*, etc., or **weight** as just another parameter.

Thus, for a given course, the true effect of the **weight** parameter can only be understood in the context of the spreadsheet the course is using to determine the number of points a student will receive for a given problem. (Using **weight** as part of the spreadsheet calculation can provide an easy way to manipulate how the problem distributes points without needing to edit the spreadsheet directly.)

If you set a course parameter (via the **PARM** button on the remote), you can access this parameter in the spreadsheet . To access the parameter 'testparm' use

`&EXT('course.testparm')`

in a cell of your spreadsheet.

7.2 Recalculating the Spreadsheet

The total number of sheets in course can be tremendous, since it is the number of students times the number of assessments. LON-CAPA caches these sheets and only selectively invalidates those cache copies if potentially relevant data changes. **Completely Recalc** forces LON-CAPA to invalidate all cache copies.

For instance, this is necessary to get the most up-to-date calculations if the sheet itself contains direct access to the system clock (making it "out-of-date" the moment it is calculated), or if an assessment is edited in a way that would retroactively change grading. The automatic spreadsheet devalidation catches student submissions, **PAR**a**M**eter changes, and spreadsheet changes, but not re-publication of a problem resource.

7.3 Specifying Cells

Cells are specified by the letter-number combination of their position in the table, for example "A5". Note that the columns are labeled "A-Z" and then to the right of that "a-z" (lowercase).

There are also the wildcards '*' and '#' which are used in ranges (see 7.3), templates (see 6.1), and symbolic names (see 7.1).

Ranges specify rectangles of various shapes in the spreadsheet, just as ranges do in traditional spreadsheets. Examples of legitimate ranges:

- ***** - all rows, all columns
- **B*** - all rows in column B
- ***5** - all columns in row 5
- **C5..F25** - all cells in the rectangle between C5 and F25

Many functions accept ranges. For example, &SUM("d*") will add up all cells in column d.

7.4 Using Cells

7.4.1 Lists

When you have a list of numbers in a cell, how it is displayed depends on how you separate the numbers and how Perl interprets the results.

35 45 12 will not generate any result because this is an invalid perl statement.

35,45,12 will have a result of 12 because Perl has a comma operator similar to the comma operator in C.

The comma operator is binary and returns the value on its right. Thus `$variable = 15, 26;` assigns `$variable` the value 26. If you need the values to all be displayed, enclose the entire cell contents in quotes.

7.5 Available Functions

The following functions are available in the spreadsheet:

- `&NUM(range)` - number of non-empty cells in range
- `&BIN(low, high, range)` - number of non-empty cells in range with values between low and high
- `&SUM(range)` - sum of the non-empty cells in range
- `&MEAN(range)` - mean value of non-empty cells in range

- `&STDDEV(range)` - standard deviation of non-empty cells in range
- `&PROD(range)` - product of non-empty cells in range
- `&MAX(range)` - maximum value of non-empty cell in range
- `&MIN(range)` - minimum value of non-empty cells in range
- `&SUMMAX(n ,range)` - sum of the maximum n non-empty cells in range
- `&SUMMIN(n, range)` - sum of the minimum n non-empty cells in range
- `&EXT(expression)` - access to EXT function in lonnet

In addition, non-IO Perl functions work in cells, which is internally evaluated within a safe space. Field names and Column-Row combinations can be used as variables.

To take the sum of column "M", for example, use `&SUM(''M*'')`

7.5.1 ? :

The ?'s and :'s seen in the spreadsheet cells are part of compact notation for an if-then-else clause. Something like:

```
( B2 > 16 ?  'passing grade' :  'failing grade')
```

can be translated into:

```
if (B2 > 16 ) {
 $temp = 'passing grade';
} else {
 $temp = 'failing grade';
}
$temp;
```

The nicest part of the `( ? : )` operator (aside from its compactness) is the way it automatically returns the value you want without having to use any temporary variables.

7.6 Handling Multi-part Problems

Often, there are several parts in a specific problem. For example, a problem with three parts would have parts 0, 11, 12, and 13. For a general spreadsheet, it is not often desirable to sum up all of these parts, while not knowing how many parts there are as the spreadsheet is written.

The spreadsheet has a preprocessor which an expand a symbolic expression over all symbolic names that fit. The general syntax is `[&EXPANDSUM(VARNAME;expression)]`.

For example, for the above assessment with three parts,

`&EXPANDSUM(PART;parameter_PART_weight*stores_PART_awarded)`

would become

```
parameter_0_weight*stores_0_awarded +
parameter_11_weight*stores_11_awarded +
parameter_12_weight*stores_12_awarded +
parameter_13_weight*stores_13_awarded +
```

where **bolded text** is used to highlight what the `&EXPANDSUM` function is doing. In multi-part questions, "tries" is now the average number of tries to get the parts right. The full data for each part is still stored by the system. To expand the data and work with all parts, please see 7.6.

In multi-part questions, "tries" is now the average number of tries to get the parts right. The full data for each part is still stored by the system. To expand the data and work with all parts, please see 7.6.

8 Troubleshooting and Tips

8.1 Common Error Messages

8.1.1 Max Depth Exceeded

The "Maximum Calculation Depth Exceeded" error can occur when you reference other cells in calculations. For example, if you have:

```
G0 = Some_complicated_expression
X0 = G0>2?1:0
```

Try replacing `X0`'s contents with `[ (Some_complicated_expression) > 2]?1:0`. In other words, replace the reference to `G0` with the actual contents of `G0`. That might fix your error by removing one level of indirection that LON-CAPA must process in order to compute the result.

8.2 Common Problems

8.2.1 Empty Rows Showing

To avoid showing "empty rows" in the spreadsheet, you can check the **Hide** box on the spreadsheet itself, or you can change the default functionality in the **Course Environment**, available through pushing the **PARM** button.

8.2.2 Out-of-Order Rows

Once a sheet is saved, there is a one-to-one relationship between a certain row and a specific student in the course-level sheet, and a specific assessment in the student level sheet. Thus, specific cell names like "A5" can be used in calculations. Changing class enrollment or course content, respectively, after saving a sheet will bring the row numbers "out of order".

8.2.3 Changes to Grading Scheme

If you change the grading scheme in the spreadsheet, the student's view of the problem will be unaffected (still show "correct" or "incorrect"), as the problem view never shows how many points a problem is worth. Their view of their own spreadsheet (which they obtain through the **GRDS** button) will show the updated points calculation.

8.3 Tips

8.3.1 Alternate View

If you want an alternative spreadsheet view of the same data, save the sheet without making it default. Then use "load" if you want to use the sheet again.

8.3.2 Changing Student Spreadsheets

To change the spreadsheet sheet that students see, use **Save As...** on the level of spreadsheet that you want to change, and check the box **Make Default**.

If you only want to change the sheet for specific assessments, save the assessment level sheet and do not make it default. Instead, on the student level sheet, use the pulldown menu next to the particular assessment.