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ENTERPRISE

Enterprise Timetabler

User Guide



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1 Software Overview

Enterprise Timetabler is a graphical interface for Syllabus Plus that enables the viewing and editing of timetables from a single comprehensive screen. The user is provided with a set of interactive panes which enable simple scheduling changes, information searches, and the provision of timetabling solutions.

As well as reproducing some of the functionality already available in Syllabus Plus, Enterprise Timetabler has some completely new functions that are summarised below. Users that are authorised to do so may switch to the Syllabus Plus Classic interface whenever they wish to use the functionality that is not available in Enterprise Timetabler. Conversely, a user may be restricted to using the Enterprise Timetabler interface only thus preventing them from making changes to the underlying reference data.

Any changes made in Enterprise Timetabler automatically update the underlying Syllabus Plus image. Write back to and refresh from the Scientia database is under user control.

1.1 Functions Unique to Enterprise Timetabler

A summary of the functions that are unique to Enterprise Timetabler is as follows:

- Users can personalise their workspace
- Provides a multi-week timetable view.
- Supports creation of Activity Variants.
- Supports creation of Jointly-taught Activities.
- Resources Editor to refine resource, day and time changes over and above the capability of the blue diamonds.
- Master timetable grid with a drag and drop capability.
- Click and drag capability to extend the duration of activities.
- More advanced filtering and sorting of object lists.
- Capability to customise the content of the timetable grid.
- Printing from the timetable grid
- Allows “Full” or “Request” permissions to change scheduling and resources in multi-user mode.
- Allows Problem Waivers



Users upgrading from Syllabus Plus 3.x will be used to viewing a timetable for a single week. In order to see timetables that cover multiple weeks, a print preview would be required. Enterprise Timetabler allows multiple week timetables to be viewed on screen. Edits to activities can be applied to all (default mode) or some (Activity Variant mode) of their weeks.

1.2 Full & Request Permissions

When operating in a multi-user environment, users of Enterprise Timetabler may be given different levels of allocation permission for different resources. Each user may have **No** permission, **Full** permission or **Request** permission for the allocation of each resource.

Details of individual users and their allocation permissions are contained within a database using the Authorisation Manager software.

If the user has **No** permission to a resource, then the resource will not be visible to the user. When viewing the timetable from a *Location* perspective, for example, the user will not see such a resource in the list of locations. Moreover, when searching for resources that are available for an activity, such a resource will not be presented as an option.

If the user has **Full** permission to a resource, then the user will be able to view the timetable from the perspective of that resource, and will be able to allocate that resource in the process of scheduling an activity.

Request permission lies between **No** permission and **Full** permission. A user with **Request** permission to a resource will be able to see the timetable for that resource, but when searching for available resources for an activity, such a resource will not be shown in *normal use*. The user may, however, switch to working in *Request Mode* using the  icon on the Toolbar. In this mode, the results of a search for available resources will include resources to which the user has **Request** permission. The user may select such a resource but it will not be allocated *immediately*. Rather, a request for the use of that resource will be generated. A user with **Full** permission to that resource must grant the request for the allocation to be made.

Once a requested resource has been granted, this does not give the requester carte blanche to use the resource. If, for example, the user wishes to move the activity that uses the requested resource to a different day/time, that would generate a further request. A user with **Full** permission to the resource would have to grant the request. Once the request has been granted, changes that do not result in any change to the timetable of the requested resource (e.g. changing the member of staff teaching in a room, the students attending the class, the name of the activity, reducing the number of weeks or cancelling the activity), can be carried out without a new request being generated. Changes that result in additional or changed use of the resource (e.g. extending the duration, adding weeks, changing day/time) will generate a new request.

2 Enterprise Timetabler Elements

This handbook has been produced using a version of Enterprise Timetabler under Windows XP. Some of the system controls may look slightly different if you are using a different version of Microsoft Windows, but the functionality of the application should remain the same.

The opening screen of Enterprise Timetabler consists of a series of panes each of which is explained in detail below.

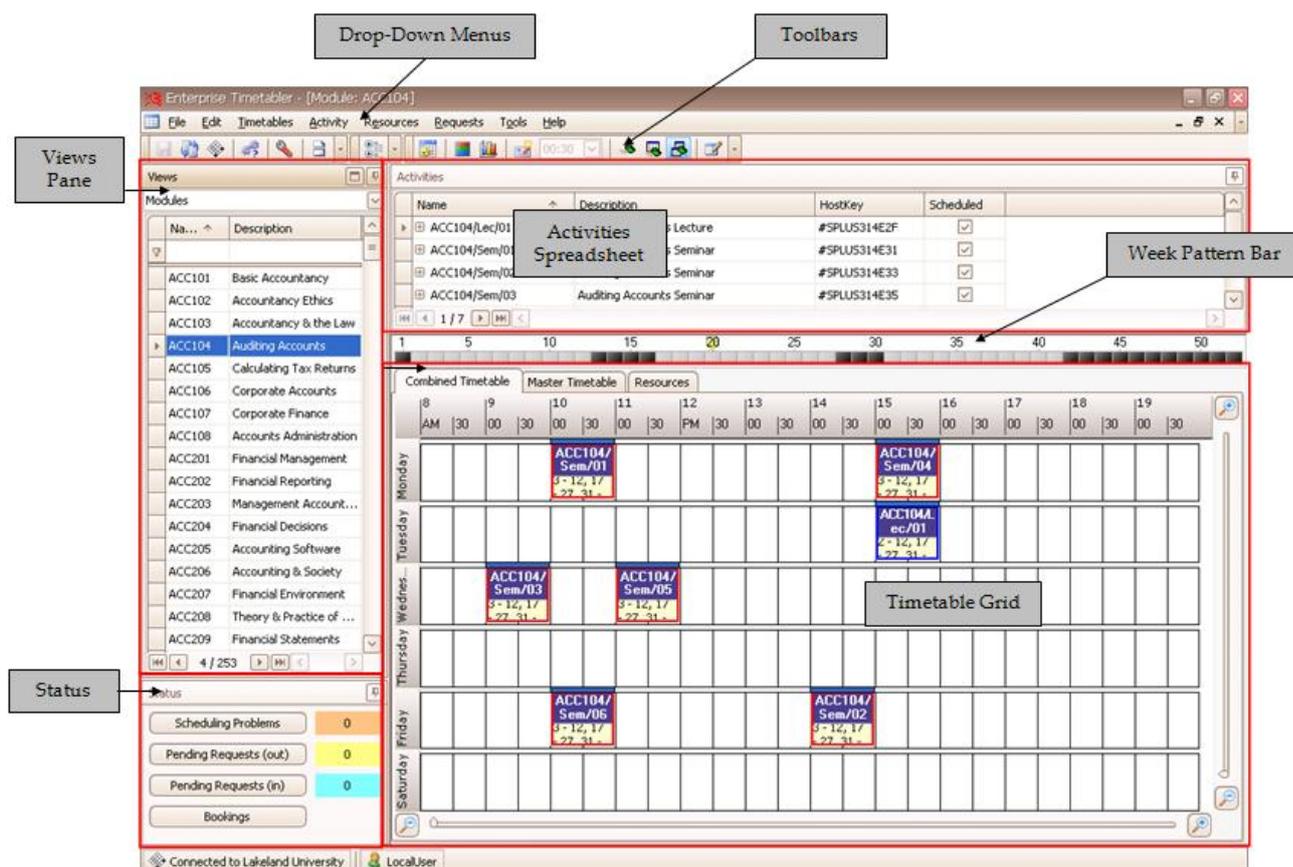


Figure 1 The Enterprise Timetabler interface

2.1 Drop-Down Menus

The **Drop-down Menu** bar contains various menus which allow the user to undertake actions within Enterprise Timetabler. Menu items can be accessed by selection with the mouse or other pointing device or using keyboard shortcuts. Hotkeys are indicated by underlining.



Figure 2 Menu bar

2.2 Toolbars

A **Toolbar** facility is available within Enterprise Timetabler allowing the user access to frequently used functions. A *tooltip* describing each function is revealed by hovering over the selected icon with the mouse.

The following actions are available using the buttons that appear by default. Additional functions can be added as part of the user's personalisation.



- Writeback changes to SDB.
- Refresh changes from SDB.
- Goto S+
- Toggle request mode
- Toggle constraint breaking mode
- Enter variant mode



- Toggle weeks locking
- Toggle display of violation colours
- Toggle display of scheduling scores
- Toggle display of start times (figure that follows is default activity duration)
- Show free / busy times
- Show activity name only
- Show activity details
- Edit activity layout
- Toggle filter mode



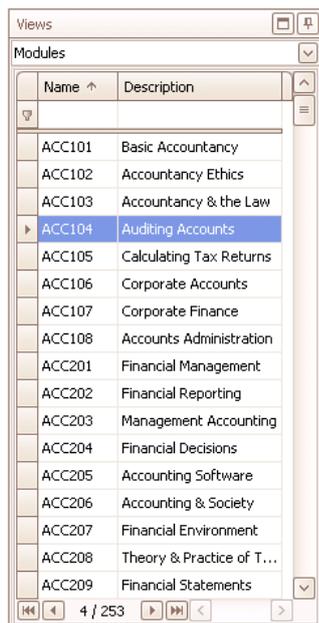
- Toggle booking mode
- Confirm booking
- Cancel booking



- Toggle display of waived problems

Each of the toolbars can be personalised using the Add / remove items button. This allows menu items to be added (or removed) as toolbar items. In addition, the toolbars can be repositioned as required by dragging them using the left-hand end.

2.3 Views Pane



The **Views Pane** enables the user to choose which object type they wish to view.

In the illustration shown, the currently viewed object type is *Modules*.

Figure 3 Object view - modules

Clicking on the  symbol to the right of the box will open a drop-down menu from which other object types can be selected.

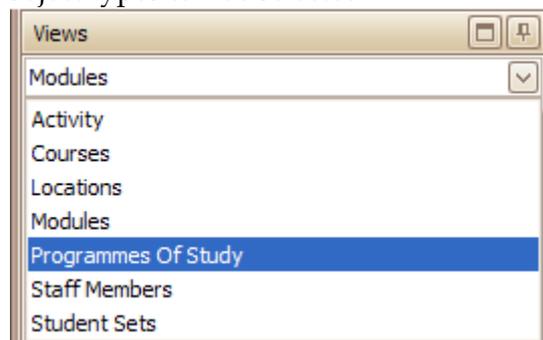


Figure 4 Object type selection list

When the user selects the object type they wish to view, a list of the chosen objects appears in the **Views Pane**. It should be noted that the list of types will include only types where the user has permission to view one or more objects. If, for example, the data does not contain any items of equipment then “Equipment items” will not be presented as a viewing option. If equipment items are present but the user is not authorised to allocate or even request those items then, similarly, the “Equipment items” view will not be presented as an option.

| | |
|----------|-------------------------|
| ACC101 | Basic Accountancy |
| ▶ ACC102 | Accountancy Ethics |
| ACC103 | Accountancy & the Law |
| ACC104 | Auditing Accounts |
| ACC105 | Calculating Tax Returns |
| ACC106 | Corporate Accounts |

Objects can be selected from the list either, singly or in combination, using the mouse. Using Shift and click allows selection of a range of objects while Ctrl and click will allow non-contiguous multiple selections.

When a selection has been made, the activities associated with the selected object or objects are listed in the **Activities** viewer, and those that are scheduled appear on the **Timetable** grid.

Figure 5 Object list showing multiple selected items



Enterprise Timetabler has been designed to give better support for distributed timetabling. For that reason, each user is shown only the data for which they have appropriate permissions. In general the Views Pane will update quickly with a list of objects of the type selected. If used by someone with extensive permissions then the volume of data to be loaded is much greater. As a result, the first time that a particular view is selected, there will be a noticeable time lag before the list of objects appears. Once the data has been cached, the response time will be reduced.

2.4 Personalisation of the Views Pane

The user can personalise the columns of data shown, the order in which those columns appear, the sorting grouping and filtering of items in the Views pane. A detailed description of how to invoke each of these options is given below.

2.4.1 Changing the width of the pane

When the mouse pointer is positioned over the rightmost edge of the Views pane, the mouse cursor will change to a double headed arrow. In this mode the user can adjust the width of the pane using a click and drag operation.

2.4.2 Adding Columns



Columns are added to the **Views Pane** by using the *Column Chooser*. A right click on the column header of the **Views Pane** invokes a speed menu. Selecting *Column Chooser* from this menu will open the **Customisation** window.

The **Customisation** window shows all of the additional information that can be displayed for the object type currently being viewed.

Additional columns can then be dragged and dropped into the **Views Pane** as required. Columns can be removed by dragging the column header to the **Customisation** window or by dragging it away from the header position until a cross appears.

Figure 6 Customisation control

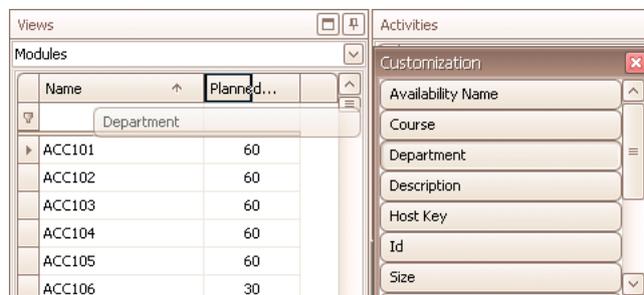


Figure 7 Department column being added

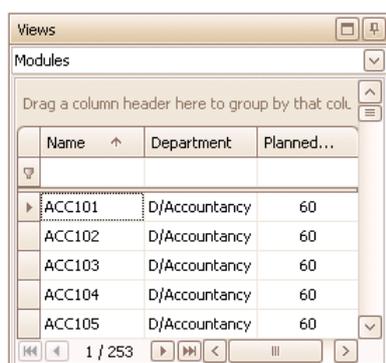
In the illustration shown, the Department column is being added to the right of the Name column.

2.4.3 Changing the sort order

The order in which objects are listed in the **Views Pane** can be changed by clicking on the header of the desired column. A second click on the same column header will sort on the same column but reverse the sort order. Holding down the Shift key and clicking on additional column headers will add secondary sorting.

2.4.4 Grouping

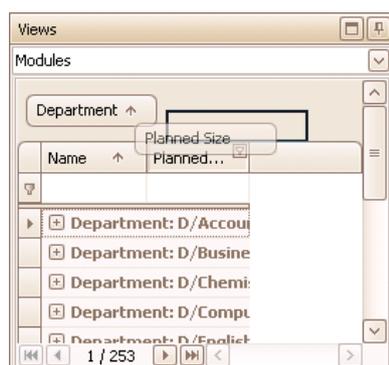
Single level grouping can be achieved by a right-click on the column header of the desired column. Select *Group By This Column* to group the objects by the selected column.



More complex grouping can be achieved by right-clicking on the column header box and selecting *Group By Box* from the configuration menu.

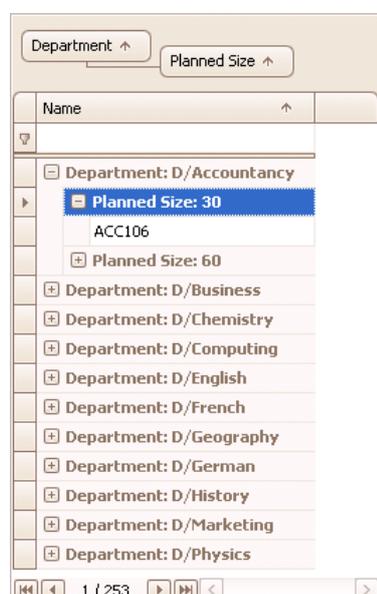
An additional area appears on the palette enabling the grouping of objects by columns.

Figure 8 Object list with Group By Box enabled



Column headers can be dragged and dropped to create multiple levels of grouping. The illustration shows the *Planned Size* column being dragged to become a sub-group of the *Department*.

Figure 9 Dragging a column header to the Group By Box

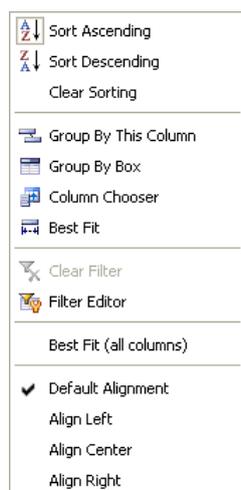


The Modules listed in the **Views Pane** are now displayed grouped by Department and, within each Department, grouped by Planned Size. The list can be expanded and contracted by using the **+** & **-** symbols.

Column headers can be dragged back from the Group By Box back to the header row of the list to undo the grouping.

Figure 10 Object list grouped by Department and Planned Size

The **Views Pane** can be further configured by right-clicking with the mouse on the Name header box. This opens a menu window containing several configuration options.



The objects list can be sorted alphabetically into ascending or descending order, any sorting can also be cleared.

Best Fit will change the column width to accommodate the information contained in any selected column.

The *Filter Editor* will open the Filter Builder window as explained below.

Best Fit (all columns) will adjust the width of *all* object columns.

Alignment of the information contained in each column can be adjusted as required.

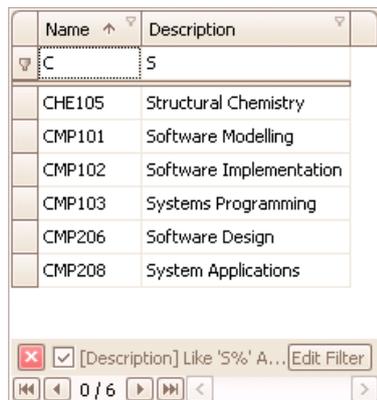
Figure 11 Configuration options

2.5 Filtering Objects in the Views Pane

There are four methods that enable filtering of the objects in the view pane.

2.5.1 Finding Objects Like ...

Below each of the column header panels is a box allowing viewed objects to be filtered by various criteria. To the left of this box is the filter symbol ().



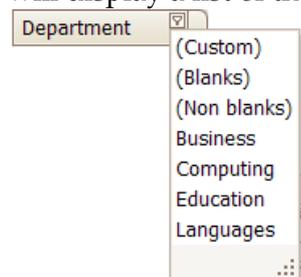
Typing names or part names into the filter boxes will automatically filter the objects in the list to find objects where the content of the field is like the content of the filter box.

The toolbar at the bottom of the palette allows the filter to be cleared (), switched on or off using the tickbox ([Name] Like 'S%'), or configured according to requirements.

Figure 12 Finding objects using "Like" filter

2.5.2 Matching Content

There is also a filter icon at the top right hand corner of each column header. Clicking on this icon will display a list of the distinct values appearing in the selected column.



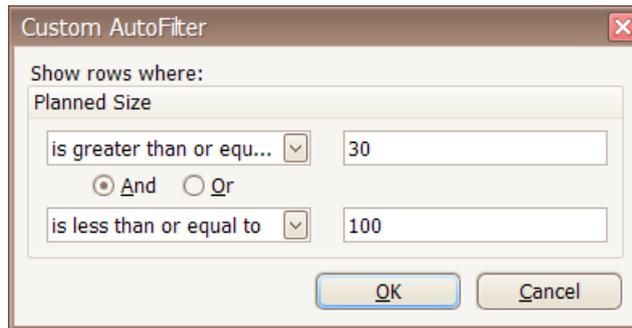
Selecting one of these values will filter the list to show only objects matching that value. The list also allows filtering to find objects where the value is blank or not blank.

While the list is active you may autosearch by beginning to type.

Figure 13 Filtering by matching content

2.5.3 Custom Filter

The same list gives a custom filter option. This allows a simple set of criteria to be applied.

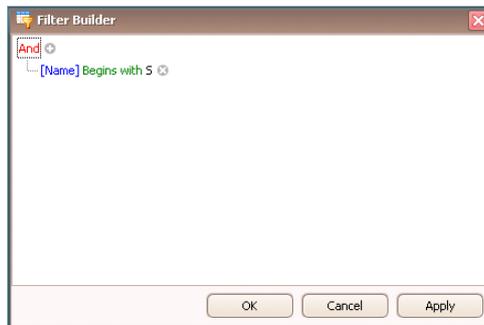


In the example shown the object list (of modules) is being filtered to show only those with a planned size between 30 and 100.

Figure 14 Custom filter control

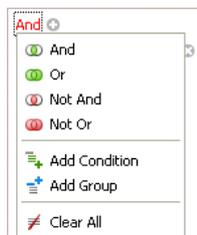
2.5.4 Filter Builder

The *Filter Builder* can be accessed from the speed menu that appears with a right-click on the column header or, if a filter is already in place, by clicking on the **Edit Filter** button.



Complex filters can be built using this window.

Figure 15 Filter Builder



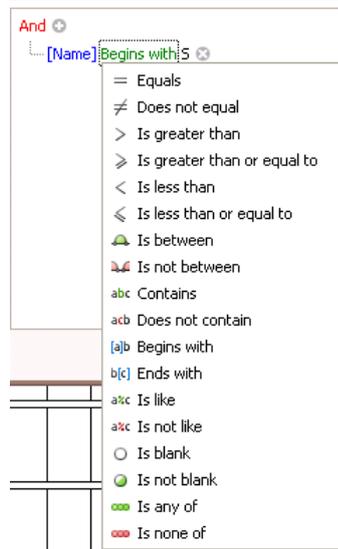
Clicking on **And** will open up an additional menu allowing a variety of filter options to be selected:

Figure 16 Filter groups



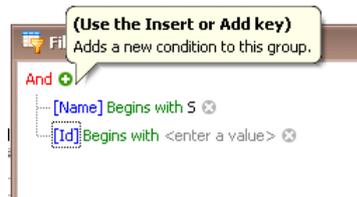
Clicking on **[Name]** opens up a further menu allowing the list to be filtered by a different property.

Figure 17 Filter properties



Clicking on **Begins with** opens another menu window allowing a choice of filtering conditions.

Figure 18 Filter conditions



Clicking on the **+** symbol allows multiple filtering conditions to be added.

Figure 19 Adding a condition



Clicking on the **x** symbol removes the relevant filtering condition.

Figure 20 Removing a condition

2.6 Activities Spreadsheet

The **Activities** pane, blank in the opening screen, is located horizontally across the top part of the timetabler.

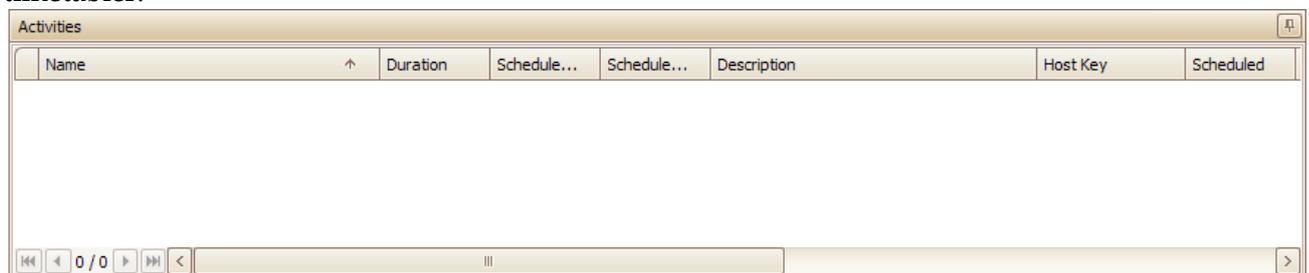
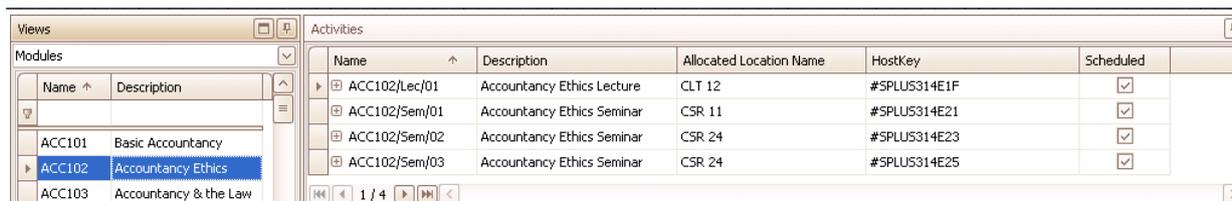


Figure 21 Activities pane

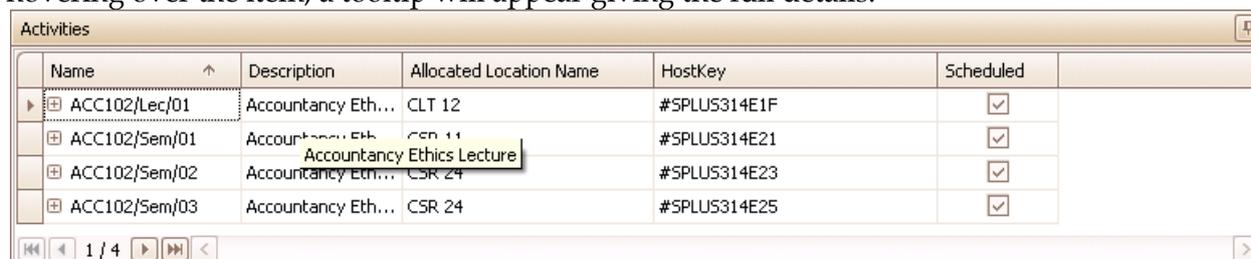
The pane is used to show the activities related to objects selected from the **Views Pane**. Selecting an object from the **Views Pane** will populate an **Activities** spreadsheet. The illustration below shows *Activities* related to a *Module*.



| Name | Description | Allocated Location Name | HostKey | Scheduled |
|---------------|----------------------------|-------------------------|--------------|-------------------------------------|
| ACC102/Lec/01 | Accountancy Ethics Lecture | CLT 12 | #SPLUS314E1F | <input checked="" type="checkbox"/> |
| ACC102/Sem/01 | Accountancy Ethics Seminar | CSR 11 | #SPLUS314E21 | <input checked="" type="checkbox"/> |
| ACC102/Sem/02 | Accountancy Ethics Seminar | CSR 24 | #SPLUS314E23 | <input checked="" type="checkbox"/> |
| ACC102/Sem/03 | Accountancy Ethics Seminar | CSR 24 | #SPLUS314E25 | <input checked="" type="checkbox"/> |

Figure 22 Activities pane populated

Activities can be selected from the spreadsheet using the mouse. When the information contained in a column is partly hidden due to limited column width, the column can be widened or, by hovering over the item, a tooltip will appear giving the full details.



| Name | Description | Allocated Location Name | HostKey | Scheduled |
|---------------|--------------------|-------------------------|--------------|-------------------------------------|
| ACC102/Lec/01 | Accountancy Eth... | CLT 12 | #SPLUS314E1F | <input checked="" type="checkbox"/> |
| ACC102/Sem/01 | Accountancy Eth... | CSR 11 | #SPLUS314E21 | <input checked="" type="checkbox"/> |
| ACC102/Sem/02 | Accountancy Eth... | CSR 24 | #SPLUS314E23 | <input checked="" type="checkbox"/> |
| ACC102/Sem/03 | Accountancy Eth... | CSR 24 | #SPLUS314E25 | <input checked="" type="checkbox"/> |

Figure 23 Additional detail shown by hovering

A navigation toolbar is available at the bottom of the viewer allowing the user to move between activities. Hovering over each button reveals a tooltip.

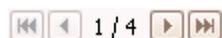


Figure 24 Navigation buttons

2.6.1 Personalisation of Activities Spreadsheet

The columns displayed in the **Activities** spreadsheet can be personalised in the same way as those in the **Views** pane. The user may add / remove columns, change the order of columns, change the sort order and group or filter on the content of columns using the same techniques described in sections 2.4 and 2.5.

2.6.2 Filter mode of Activities Spreadsheet



The filter button on the toolbar allows the user to toggle the behaviour of the **Activities** spreadsheet between two modes. In normal operation the timetable grid (usually underneath the spreadsheet) will show all of the scheduled activities currently displayed in the spreadsheet. When switched to filter mode, the timetable grid will display only the selected activity(ies). Each time the button is clicked the mode will be switched.

2.7 Grouping and Tagging

The user may wish to associate an activity or a number of activities with a tag or a group. Either operation can be carried out from the Activity Editor.

To associate an activity or activities with a group or a tag the user must first select the desired activity(ies) from the activity list. A single activity can be edited by double-clicking on the activity to open the activity editor. If more than one activity is being edited then the user must open the activity editor using the menu option (Activity | Edit Activity) so that the edit that follows is applied to all the selected activities.

2.7.1 Grouping

If a single activity is selected then the groups list will show as selected any group to which the selected activity already belongs. If the user has made a multiple selection of activities then no groups will be shown as selected. The user may either overwrite the existing group membership of the selected activity(ies) or append the selected activity(ies) to additional groups.

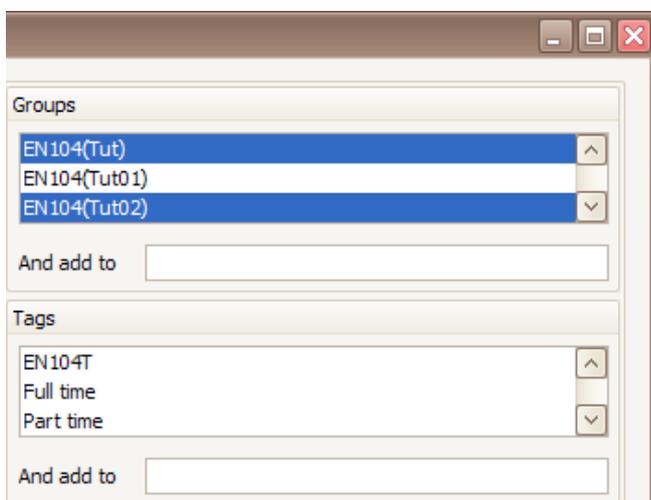


Figure 25 Groups and tags

If the user selects groups from the list of groups presented, the existing group membership of the activity(ies) will be overwritten so that they will become members of the selected, and only the selected, groups.

If the user types the name of a group in the field labelled “And add to” then the activity(ies) will be added to that group in addition to any groups of which they are already members.

If the name typed in this field is not the name of an existing group then a new group will be created, with that name, and the activity(ies) will be added as members of that group

2.7.2 Tagging

If a single activity is selected then the tags list will show as selected any tag with which the selected activity is already associated. If the user has made a multiple selection of activities then no tags will be shown as selected. The user may either overwrite the existing tag associations of the selected activity(ies) or append the selected activity(ies) to additional tags.

If the user selects tags from the list of tags presented, the existing tag association of the activity(ies) will be overwritten so that they will become associated with the selected, and only the selected, tags.

If the user types the name of a tag in the field labelled “And add to” then the activity(ies) will be associated with that tag in addition to any tags with which they are already associated.

2.8 Saving layout and filtering

Once the user has achieved a layout of columns and filter settings that suits a particular purpose, the configuration can be saved under a user-defined name for retrieval at a later stage. This makes it easy for the user to switch between different configurations depending on the task being undertaken.

2.8.1 Saving

To save the current layout of columns and the currently applied filter, the user can right-click on the header row of either the object list or the activity list and select “Save Layout ...” from the menu as shown.

The user will then be prompted to enter a name to identify the saved layout. The name should be a unique alphanumeric identifier. If the user enters a name that has already been used to save a layout they will be asked whether they wish to overwrite the existing named layout.

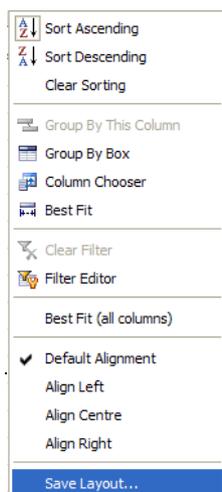


Figure 26 Saving a layout

2.8.2 Restoring

Once the user has saved layouts, two additional options will appear on the menu that is invoked from the right mouse button. The first of these allows the user to restore a saved layout. When selected, the user is prompted with a list of previously saved layouts to select from.

2.8.3 Deleting

Once saved layouts exist, the user will also have the option to delete saved layouts. Selecting this option will present the user with a list of the previously saved layouts. Selecting one of these will delete the saved layout from the list.

2.9 Week Pattern Bar

The **Week Pattern** bar is located below the **Activities** spreadsheet, and directly above the **Timetable** grid. The current week (as determined by the internal clock of the client machine) is indicated by the yellow marker.



Figure 27 Yellow marker indicating current week

2.9.1 Object's Viewed Weeks

When an object is selected in the **Views Pane**, the bar will generally reflect the union of the weeks of the activities of the object selected. In other words you will be viewing all of the weeks in which any activity is scheduled for that object. Weeks that are currently in view are shaded light grey.

In the case where the selected object is a module, the selected weeks will reflect the week pattern of the module. Weeks outside of the module week pattern are shaded dark grey as shown below.



Figure 28 Week bar in module view

2.9.2 Refining the Object's Viewed Weeks

Weeks can be deselected by left-clicking on them with the mouse. When a week is deselected the grey shading disappears. To select a single week, right-click with the mouse on the required week.

To view a timetable over a number of weeks, either click and drag the mouse along the week bar, or right-click above the week bar and choose a Named Availability such as "Autumn Term". Using

this method other intuitive options are available to the user.

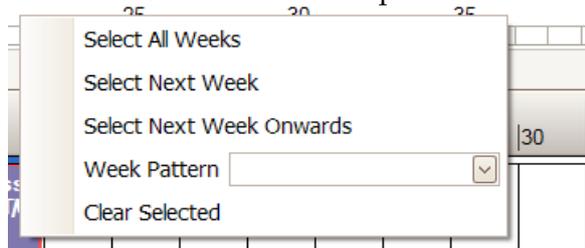


Figure 29 Week selection options

2.9.3 Locking the Viewed Weeks

In normal use the weeks being viewed will update to reflect the selected object or activity. When an object is first selected the weeks are changed to show all weeks when the object has an activity. When an activity is selected, all the weeks of the activity are shown.

The user can override this behaviour by locking the viewing weeks. Clicking on the **Lock Weeks** button on the toolbar will lock the viewed weeks to the currently selected set of weeks, preventing the automatic update described above.

2.9.4 Displaying the Activity's Weeks to be Edited

Once an activity is selected, the view will change to show *all* the weeks in which the selected activity has been scheduled to take place. These weeks will be selected (in grey) and will have a green block in the centre indicating that the currently selected activity is scheduled in this week as shown below.



Figure 30 All activity weeks selected

Any selection of weeks can be viewed by the user. Left-clicking with the mouse on a week will *deselect that week*, right-clicking with the mouse on a week will *select that week only*. If the selected activity is dragged and dropped into a different timeslot, the activity will reschedule for the *entire week pattern*. Viewing weeks 20, 21 and 22 is illustrated below:



Figure 31 Subset of activity weeks selected

Where the user needs to create activity variants, (changing the activity resources or day/time over part of the week pattern), the user must make a deliberate decision and select **Variant Mode** from the toolbar.

When the user enters **Variant Mode** the selected weeks will normally be blanked. The user must then select the weeks they wish to edit (a subset of the weeks of the selected activity). Any week in which the selected activity is scheduled, that is not selected, now changes to red, reminding the user that the edit will result in the activity being split by weeks. Some weeks will be edited, (those that are green), and some weeks will remain unchanged, (those in red).



Figure 32 Variant mode - subset of weeks being edited

In the special case where the week selection is locked when the user enters **Variant Mode** the selected weeks will remain unchanged. Note that once **Variant Mode** is selected, the user is given one opportunity to create activity variants. On completion of the process, the week pattern reverts back to normal mode in order to prevent the accidental splitting of activities.



The Week Pattern bar in Enterprise Timetabler is completely different from that in Splus which restricts the user to a week-at-a-time view of the timetable. The Enterprise Timetabler user can choose to view any combination of single or multiple weeks and, in variant mode, can edit a subset of the weeks of an activity to create a new variant activity.

Hovering above the week pattern with the mouse will activate a **Week Selection** tooltip showing the user which weeks are being viewed *and* the weeks in which the selected activity is scheduled.

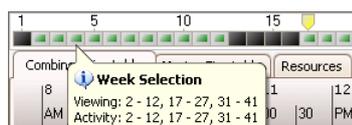


Figure 33 Week selection tooltip

Hovering over an individual week with the mouse will activate a tooltip indicating the week label *and* the start date of the week. Note that the week label is the same as the week number by default but may be edited by users with permission to the underlying Syllabus Plus Image.



Figure 34 Week label and start date tooltip

Clicking on weeks so they become non-selected change the **Week Selection** tooltip so that the viewed weeks *differ* from the scheduled weeks. The illustration below shows the tooltip in **Variant Mode**.



Figure 35 Week selection tooltip in variant mode

2.10 Timetable Grid

On opening Enterprise Timetabler, a blank **Timetable** grid will appear. Days appear down the left -hand side and times across the top of the grid.

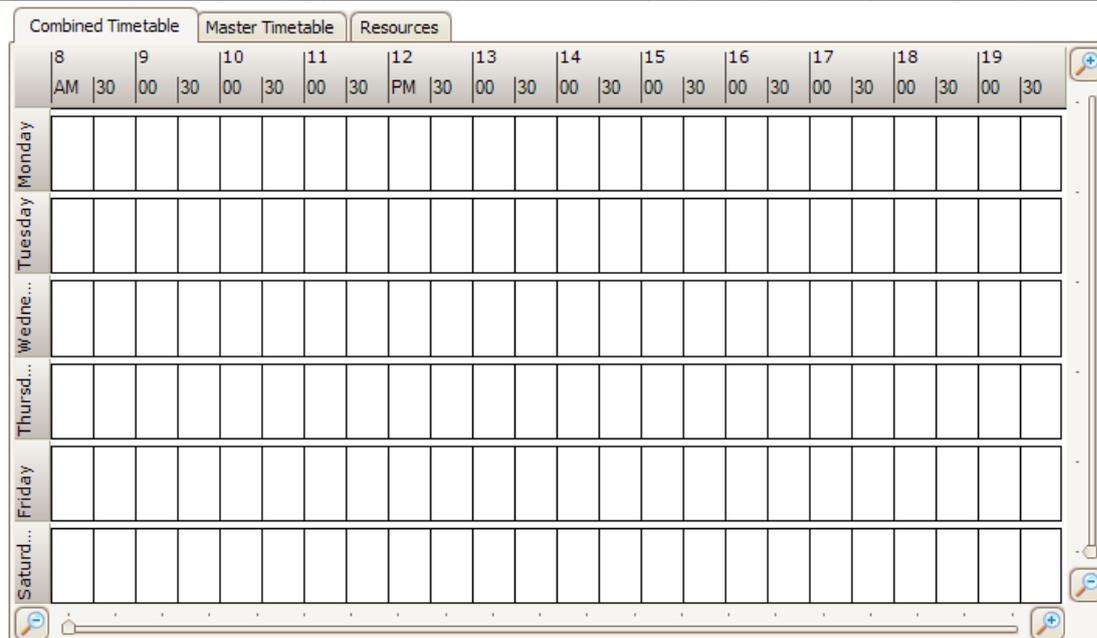


Figure 36 Timetable grid

The magnification slides at both the bottom and right-hand side of the grid allow the user to zoom in or out on each axis independently. The zoom level will remain as selected until changed by the user.

Selecting an object from the **Views Pane** populates the **Activities** spreadsheet with activities related to the selected object, and places *scheduled* activities onto the **Timetable** grid as shown below.

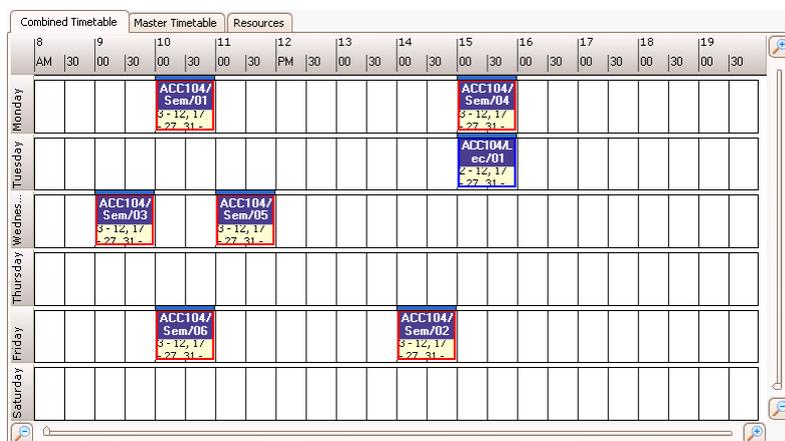


Figure 37 Timetable grid displaying activities

When no activity is selected the user may personalize the display to show start times or not by toggling on or off the **Show Start Times** icon on the toolbar. When **Show Start Times** is on, blue diamonds will indicate slots where a new activity could be created for the selected object, without breaking any constraints as shown below. The duration of the activity to be created can be determined using the **Default Period Length** drop-down menu on the toolbar.

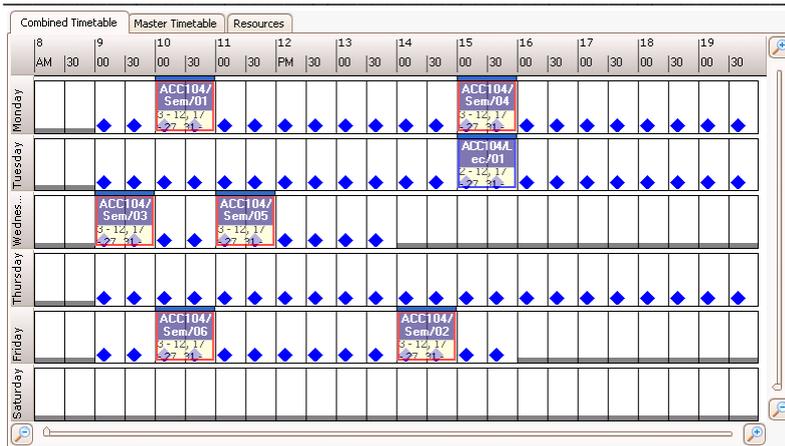


Figure 38 Timetable grid showing potential start times for a new activity

If a specific activity is selected from the **Activities** spreadsheet or from the grid, the **Timetable** grid view will change to show potential start times for the selected activity. Note that, since the duration of the activity is known, you do not need to find a contiguous set of blue diamonds in order to reschedule the activity. Each blue diamond indicates a time when the selected activity, considering its duration, could begin.

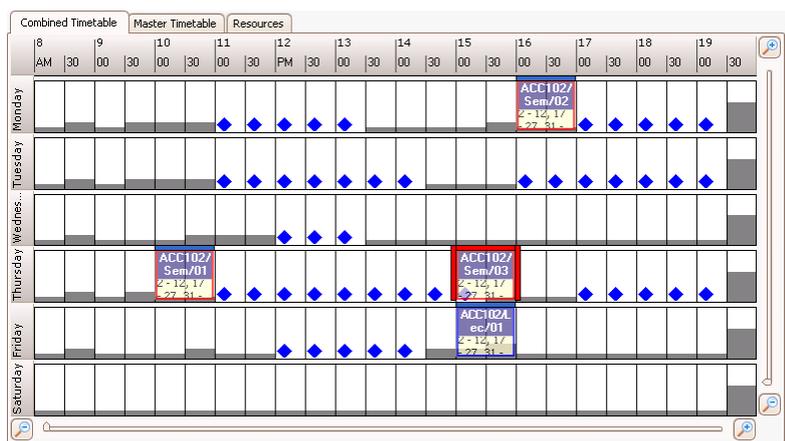


Figure 39 Timetable grid with activity selected

The tabs (**Combined Timetable**, **Master Timetable** & **Resources**) at the top of the grid allow the display to change so that different information can be viewed. Each of these tabs is explained in the following sections.

2.10.1 Combined Timetable

In the illustration below, several members of staff have been selected in the **Views Pane**. The *Combined Timetable* tab on the **Timetable** grid shows the scheduled activities of all the selected member of staff combined onto a single grid. This view is useful when searching for common available time for a multiple selection of resources. The blue diamonds indicate when an activity of the default duration could be created for all the selected objects, spanning all of the viewed weeks.

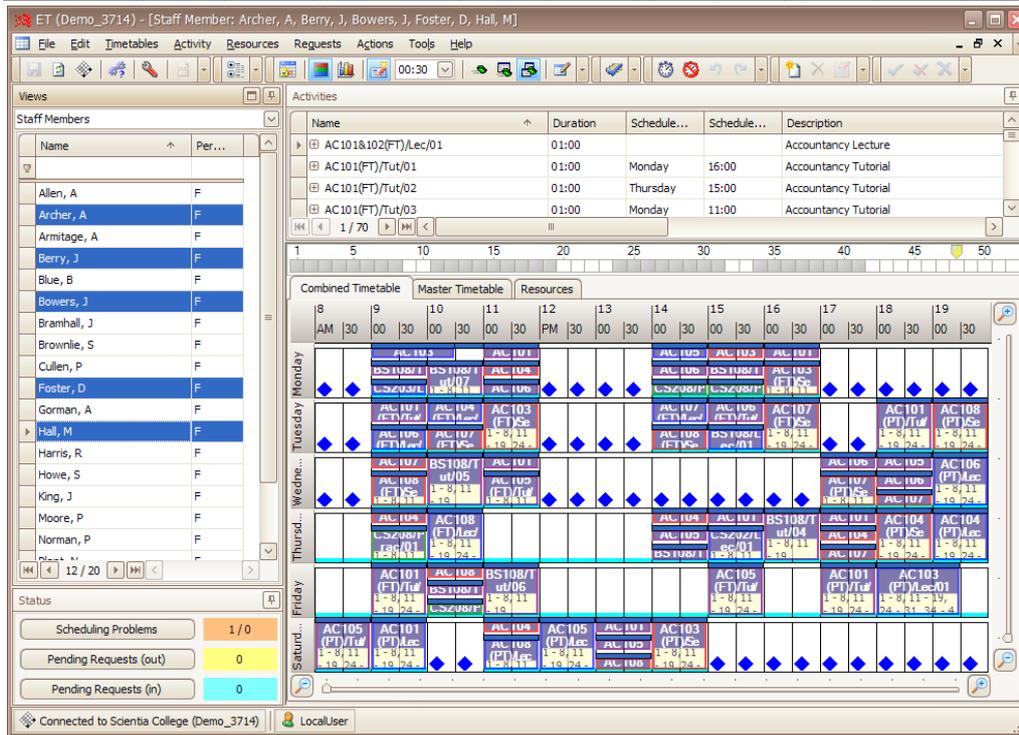


Figure 40 Timetable grid - combined view

2.10.2 Master Timetable

The *Master Timetable* tab shows timetables for multiple objects in a different style. In the illustration shown below, multiple *Locations* have been selected from the **Views Pane**.

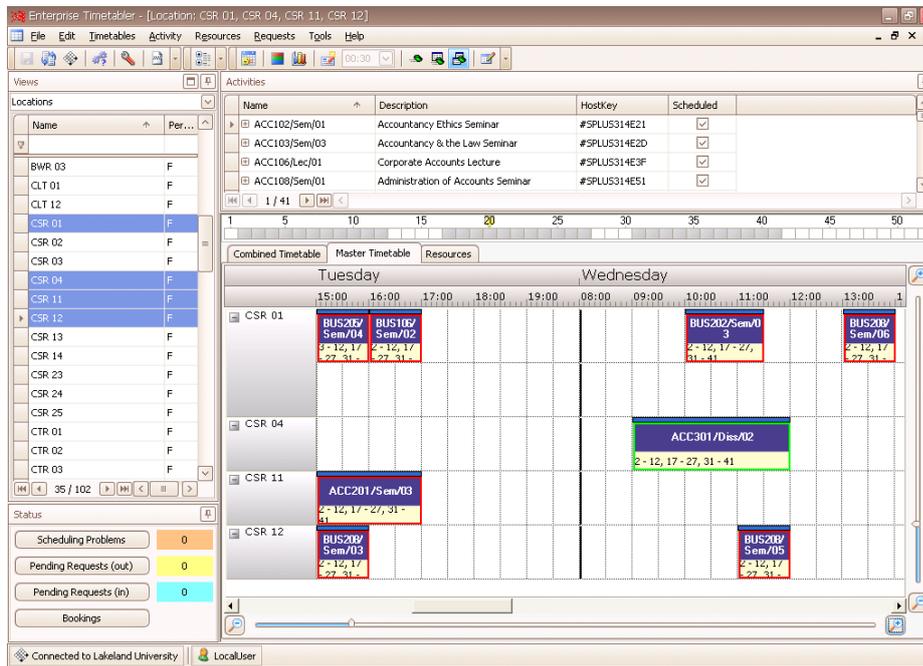


Figure 41 Timetable grid - master view

Note that a non-continuous selection of Locations can be made in the **Views Pane**, and the selected locations are listed down the left-hand side of the grid. The grid is formatted horizontally by day and time, with movement across the days facilitated by the scroll bar below the grid.

Selecting a particular activity when in the Master Timetable view will change the view so that blue diamonds give an indication of where the activity could be rescheduled across the selected rooms.

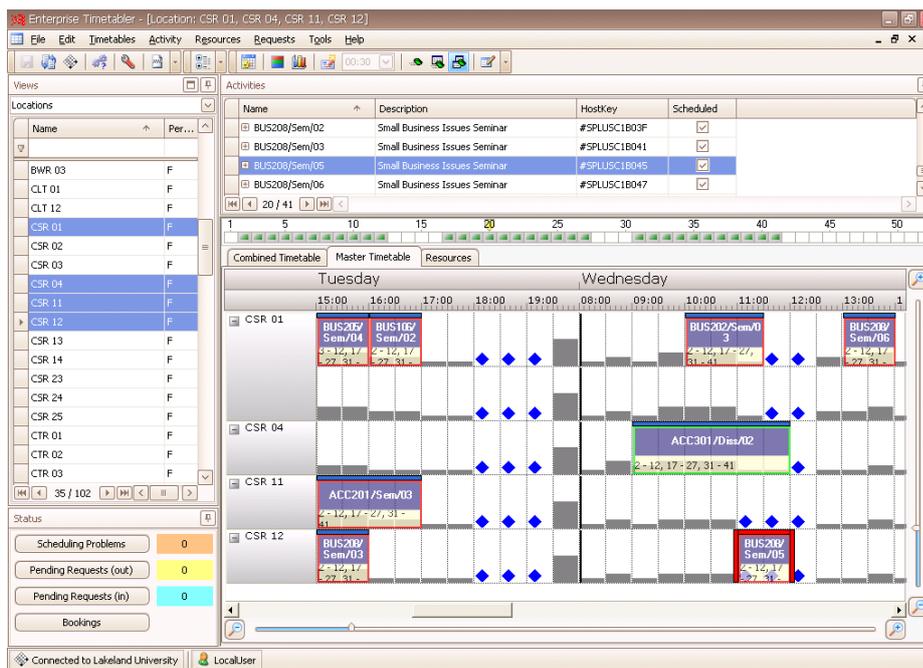


Figure 42 Master view with activity selected

2.10.3 Resource Editor

The *Resource Editor* is used exclusively for activities. The tab details the resources associated with each activity, and is used to exercise greater control over day, time and resource changes than that offered by the presence of the blue diamonds on the **Timetable** grid. A more detailed explanation of the use of this tab is given in Section 4.

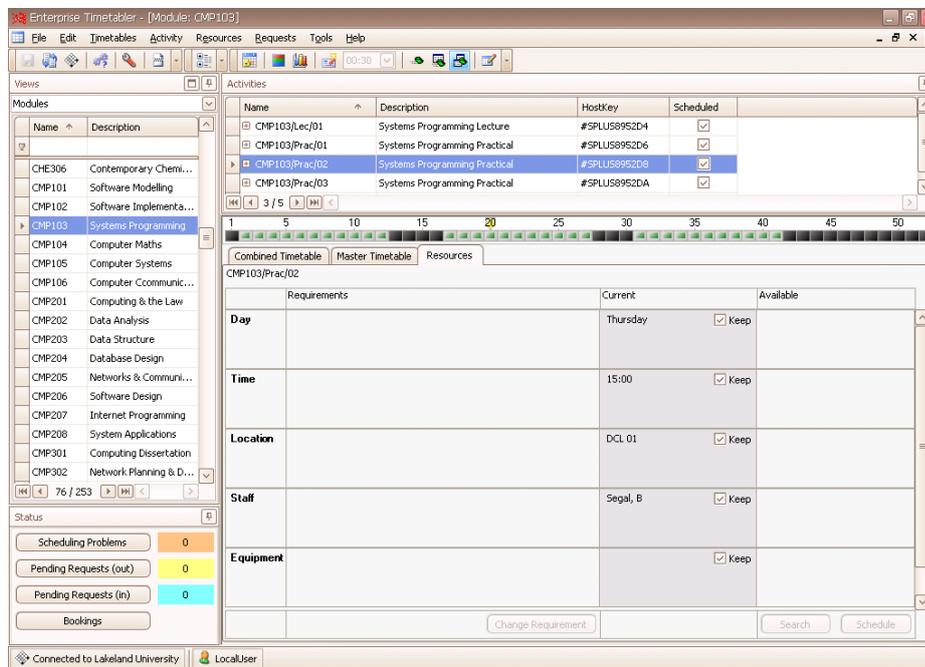


Figure 43 Resource tab

2.10.4 Multi-view Timetable

The multi-view timetable operates in a very similar way to the master timetable. The major difference is that, while the master timetable shows several resources of the same type on the y axis, the multi-view timetable shows resources of different types.

By right clicking on the selected activity and choosing “Show multi-view timetable for activity” a new timetable is opened (leaving the original timetable window in its current state) and the multi-view tab is invoked. A row in the multi-view tab will show each location, staff member, equipment item and student set allocated to the selected activity which now becomes the focus of the multi-view timetable.

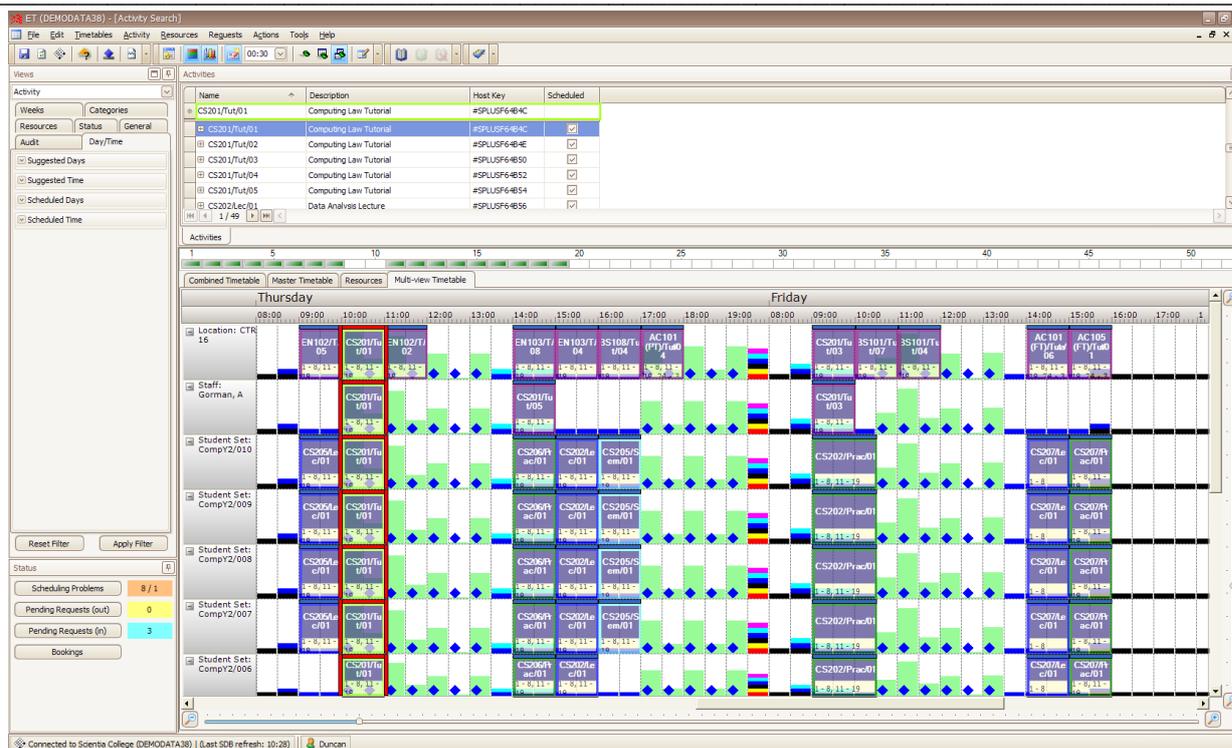


Figure 44 Multi-view timetable

The focus activity is bordered in light green in both the list and the grid view of activities and will always remain at the top of the activity list. The user may manipulate other activities as normal (using drag and drop etc) in this view but the focus activity will not change unless the user selects another activity to become the focus as described above.

The multi-view timetable allows the user (a) to see what effect moving the focus activity would have on all of the resources associated with it and (b) to adjust the timetables of any of those resources in order to accommodate a change to the focus activity or minimise the impact of such a change.

2.11 Different Timetable Styles

Combined and *Master* timetables can be personalised to give differing views.

Right-clicking with the mouse on either the day or time axis of the **Timetable** grid will open up a menu enabling various personalisation options to be selected.

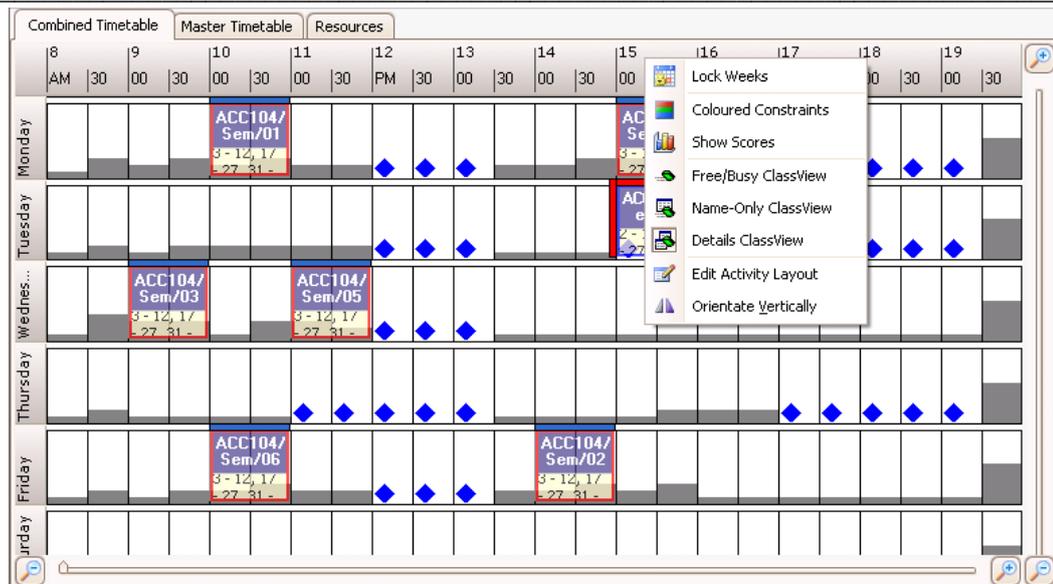


Figure 45 Timetable grid - personalisation options

2.11.1 Edit Activity Layout

Selecting **Edit Activity Layout** opens the **Activity Layout Editor** window which allows the user to edit the way in which activities appear on the **Timetable** grid.

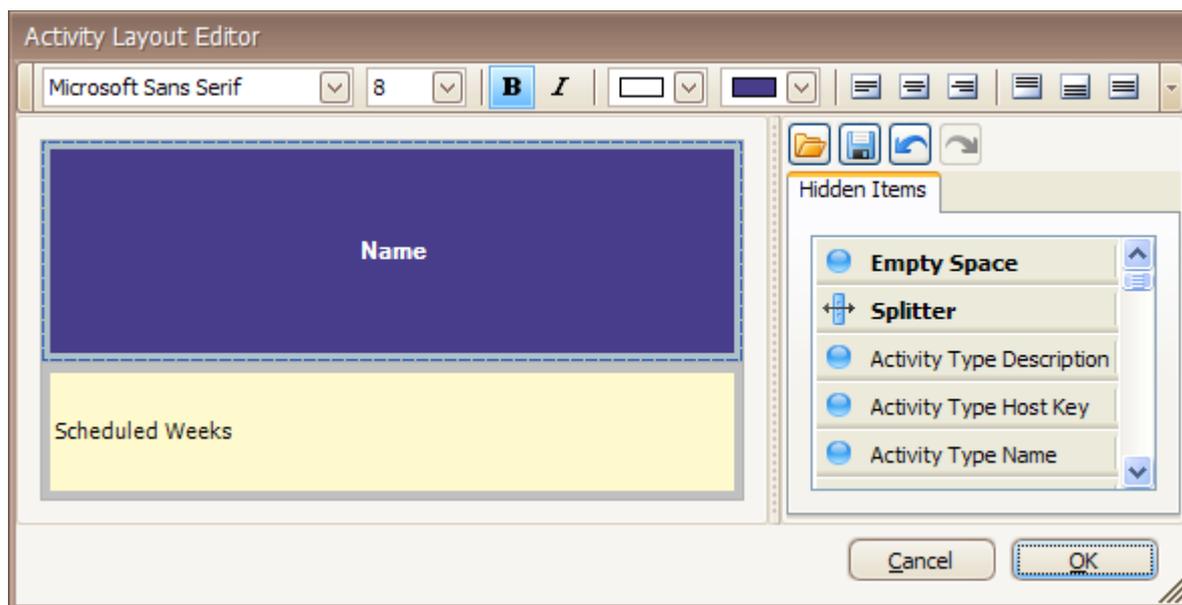


Figure 46 Activity Layout Editor

The toolbar across the top of the editor can be used to change the appearance of the activity cells.



Figure 47 Activity Layout Editor - Toolbar

With a section of the activity cell selected, the following tools are available (from left to right):

- Change the font style in the selected cell.
- Change the font size in the selected cell.
- Make the font **Bold**

- Make the font *Italic*
- Change the font colour
- Change the cell background colour
- Position the font vertically (Align Left, Align Middle, Align Right)
- Position the font horizontally (Align Top, Align Bottom, Align Middle)

The drop-down arrow at the right-hand end of the toolbar allows the toolbar to be customised.



In the *Hidden Items* palette, the **Empty Space Item** can be used to create an empty space within the cell.

The **Splitter** can be used to split cell either vertically or horizontally.

Additional information fields can be dragged from the list and dropped into the cell in whichever position is required.

Figure 48 Hidden items list

Clicking on the OK button will close the window and implement any changes. Clicking Cancel will close the Layout Editor without making changes.

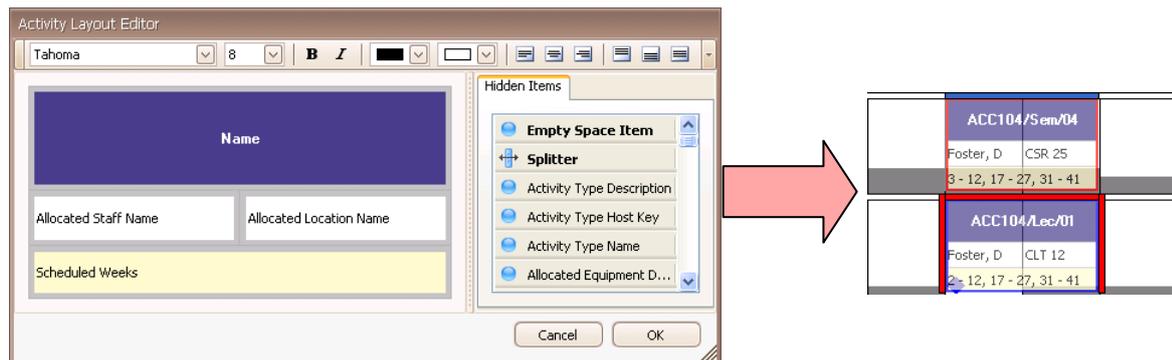


Figure 49 Applying the changes

The user may use the  buttons to Retrieve, Save, Undo and Redo respectively.

The Save function allows the user to save a file (XML format) that describes the current layout under a descriptive name. The file can be retrieved by the same user or by a different user to reset the layout at some future time.

2.11.2 Coloured Constraints

When an activity is selected on the **Timetable** tab, using **Coloured Constraints** will show any constraints on the scheduling of the activity in colour. Selecting and deselecting from the menu will switch between showing constraints in grey and using colour coded bands.

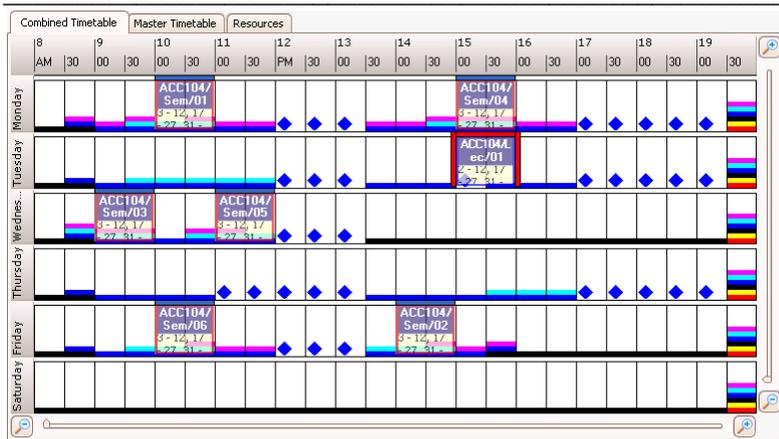
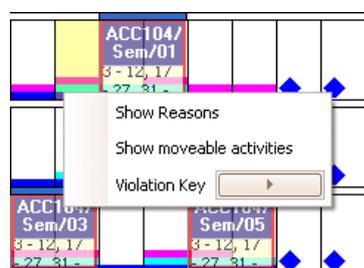


Figure 50 Timetable grid - coloured constraints

Right-clicking on any of the section of the timetable which contains coloured bars will open a small menu:



Selecting *Show Reasons* will open the **Reasons** window which details the scheduling constraints for that particular slot.

Figure 51 Constraints context menu

Note: The number of reasons shown is determined by the settings in the underlying Syllabus Plus image – **View** drop-down menu, **User Preferences**, *Number of reasons to display*. The default number is 8, but can be increased to 100.

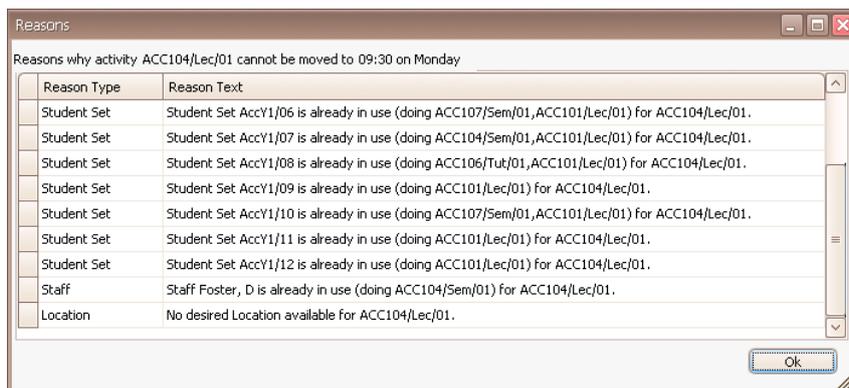


Figure 52 Reasons window

Selecting *Show moveable activities* will open a window that shows the activities that are blocking the current activity from being scheduled into the selected time slot. For each blocking activity (there may be several) the window indicates whether the activity could be (a) reallocated to use a different resource while remaining scheduled at the same time, (b) rescheduled to a different time using the same resource or (c) rescheduled to a different time where it would be allocated different resource.

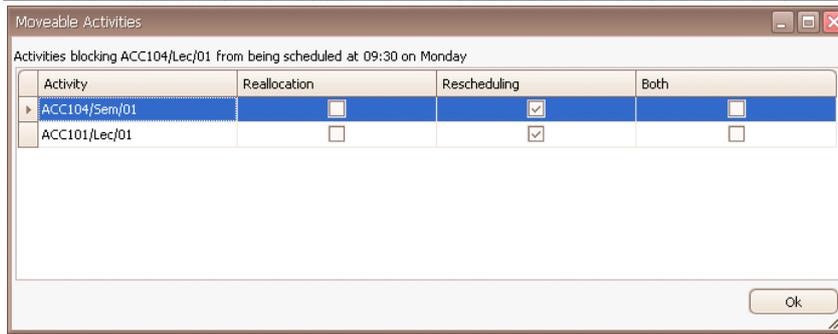
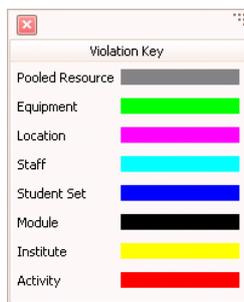


Figure 53 Moveable activities window

In the case where there are several blocking activities it is useful, before embarking on an attempt to resolve the problem, to be aware of any activities that do not have alternative time / resource options. Rather than successfully rescheduling two blocking activities only to find that the third cannot be rescheduled, this window will tell you immediately whether a first level resolution is possible; (changing only those activities that are immediately blocking the selected activity).



Selecting the *Violation key* button will open a small window reminding you of the colour scheme used to represent the constraint violations.

Figure 54 Violation key

2.11.3 Free/Busy Class View

Selecting **Free/Busy Class View** changes the view of the **Timetable** grid to simply show whether a slot is busy or not. This selection may be particularly useful when looking for free times on a Location timetable or on a Student Set timetable where the actual activity details are not required.

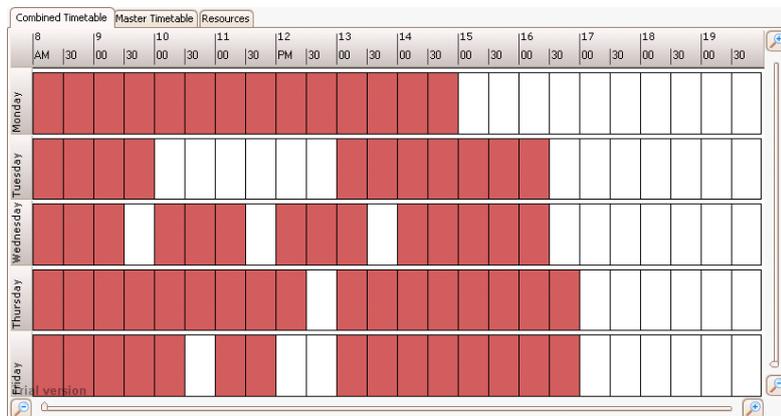


Figure 55 Timetable grid - free/busy view

2.11.4 Name Only Class View

When looking at a Programme of Study timetable for example, a detailed view of all the activities makes the **Timetable** grid too cluttered. Selecting **Name Only Class View** changes the activity cells so they contain only the name of the activity.

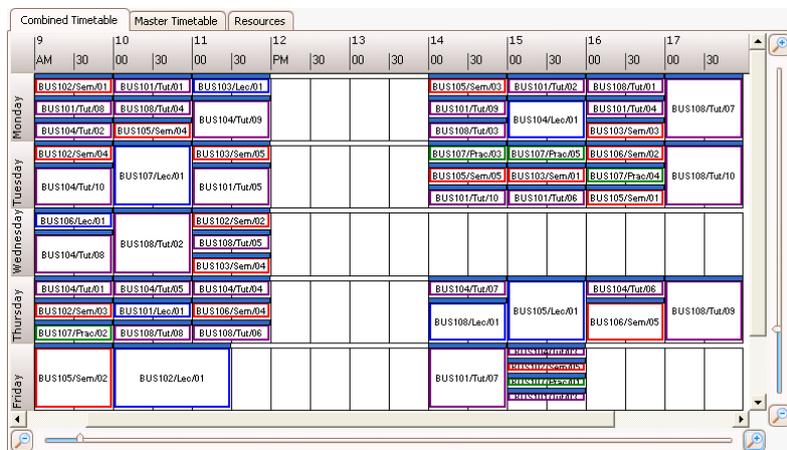


Figure 56 Timetable grid - name-only view

2.11.5 Details Class View

Selecting **Details Class View** will return the **Timetable** grid to the original configuration with detailed activity cells, where the details are determined by the **Activity Layout**.

2.11.6 Show Scores

Within Syllabus Plus, the suitability of a timeslot for scheduling an activity is determined by a calculation that considers all of the soft constraints applied to the scheduling engine. For example, a member of staff may have a strong preference for teaching at certain times, there may be a strong institutional preference for concentrating teaching between certain hours or for avoiding starting an activity on the half-hour etc.

The scheduling engine considers all of these preferences and their relative importance, (as dictated by Scheduling Preference Strengths), to determine the “best” time to schedule an activity. The relative score of each available slot, (wherever there is a blue diamond), is shown by a green bar. The height of the bar indicates how “good” the timeslot is so that the slot or slots with the highest score will have a full height green bar and the slot(s) with the lowest score will have no green bar. In other timeslots, the green bar will be shown as a proportion of the maximum height, indicating how close to “best” that slot is.

Selecting and deselecting **Show Scores** will turn the function on and off.

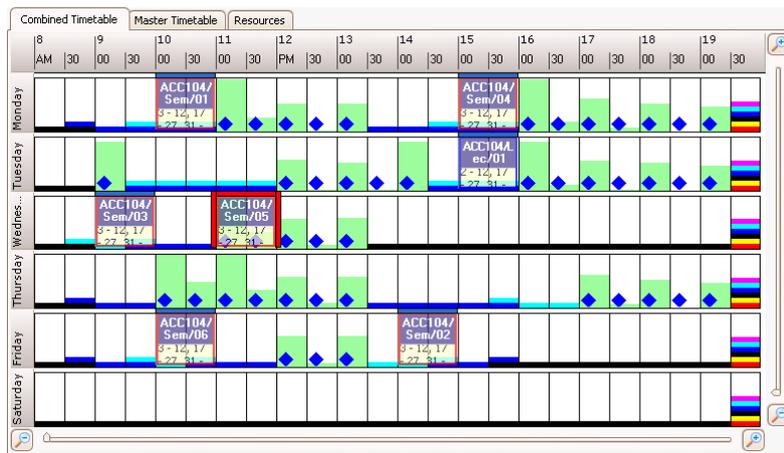


Figure 57 Timetable grid showing relative scores

2.11.7 Class View Vertically

Selecting **Orientate Vertically** allows the axes of the **Timetable** grid to be changed so that timetables can be viewed vertically instead of horizontally. The menu item allows the user to toggle between the two settings.

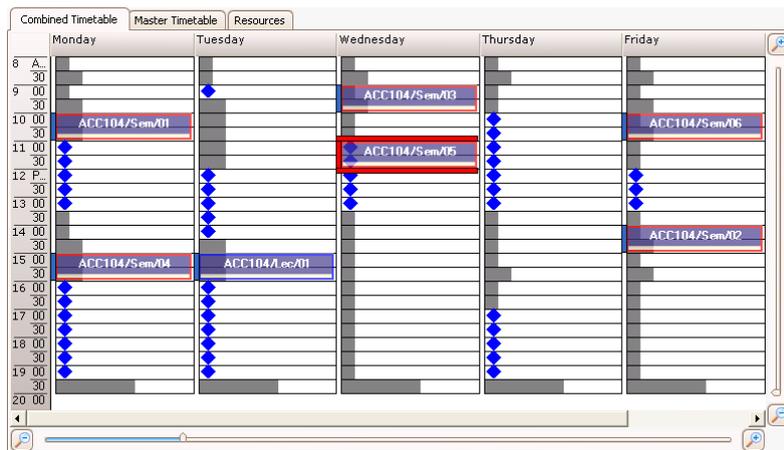


Figure 58 Timetable grid - vertical orientation

2.11.8 Status Pane

The **Status** pane allows the user to undertake quick filters of activities by the criteria listed. Selecting one of the buttons will change the **Views Pane** to the Activity object which contains a series of filters, and automatically select the required filter.

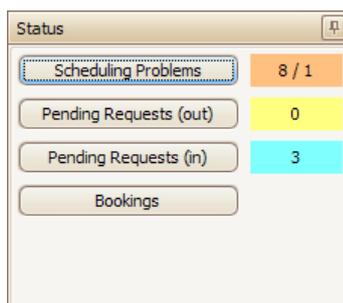


Figure 59 Status pane

Clicking on the *Scheduling Problems* button will filter activities to show in the Activities spreadsheet only those activities that have scheduling problems. The user can apply more selective filtering to narrow the list to activities with a certain type of problem.

The *Pending Requests (out)* button will filter to show activities where the current user has requested the use of a resource to which they do not have full permission. Requests that have already been granted will not show up in this view (since the requester does not need to take any further action) but requests that have been denied will be included (since the requester still needs to find a resource for the activity).

The *Pending Requests (in)* button will filter to show activities where a resource has been requested and the user has permission to allocate that resource.

More complex filtering using the Activity object in the **Views Pane** is explained in greater detail in Section 9.20.

Intentionally left blank

3 Manipulating Activities

The most important aspect of the Enterprise Timetabler user interface is its capability to manipulate activities and change the resources of those activities.

3.1 Creating a New Activity

When any object or combination of objects is selected in the object list a new activity can be created by selecting *Activity | Create Activity* from the menu. This will open the **Activity Editor** window as shown below.

The screenshot shows the 'Activity Editor' window with the following fields and sections:

- Details:** Name (#SPLUS6B8798), Host Key (#SPLUS6B8798), Description, Duration (1 00:30), Activity Type (Lec), Planned Size (0) with 'Use Planned Size' checked, and Zone ([None]).
- Groups:** A list containing EN104(Tut), EN104(Tut01), and EN104(Tut02), with an 'And add to' field below.
- Tags:** A list containing EN104T, Full time, and Part time, with an 'And add to' field below.
- Sections:** A large empty text area and a 'Section Id' field.
- Delivery:** Module (EN105), Department (Engineering), Course ([None]), Programmes (Engineering Yr1), Template, Real Size (0), and Availability ([Custom...]).
- User Text:** A large text area for 'User Text 1' and five smaller text input fields for 'User Text 2' through 'User Text 5'.

Buttons for 'OK' and 'Cancel' are located at the bottom right of the window.

Figure 60 Activity Editor

The selected object or objects will automatically be associated with the newly created activity so that if the user was viewing a module when the activity was created, the activity will be linked to that module. If the activity was created whilst viewing rooms with two rooms selected then both rooms will be associated with the activity (as preset resources).

The user may then fill in other details before clicking OK to create the new activity. The newly created activity will appear in the **Activities** spreadsheet but will not appear in the **Timetable** grid since it is not scheduled.

3.1.1 Activity Name

The name of an activity must be alphanumeric and no longer than 255 characters. In practice, activity names are usually much shorter than this, bearing in mind that the name of the activity is often used in printed reports.

The name of an activity does not have to be unique but, in practice, it is often simpler if each activity has a unique name.

3.1.2 Activity Hostkey

The hostkey of an activity is the identifier of the activity in the application that “owns” activities, usually Enterprise Timetabler. If the user does not enter a hostkey, then ET will generate a unique identifier.

3.1.3 Activity Description

The activity description is an additional 255 character identifier for the activity. While the name is often short, codifying information about the activity, the description, if used, is often a longer and more readily understandable identifier.

3.1.4 Activity Duration

The duration of a newly created and unscheduled activity can be changed using the spin button control in the activity editor window. The duration is set as a whole number of periods. The control displays the equivalent value in hours and minutes. Duration may be between 1 period and the number of periods in the institution day.

Note that if an activity is unscheduled, its duration becomes a constraint on when it can be scheduled. Blue diamonds will be displayed in the timetable grid only at potential start times for an activity of the specified duration. If, on the other hand, the activity is already scheduled then the duration will be greyed in the activity editor. The duration of a scheduled activity cannot be arbitrarily changed since that may cause scheduling problems. The method for changing the duration of a scheduled activity is explained in section 3.5.

3.1.5 Activity Type

An activity can be associated with any of the existing activity types by selecting from a dropdown list. The user of ET is not allowed to create new activity types; that is a function of **Enterprise Desktop Reference Data Manager**.

3.1.6 Activity Planned Size

The planned size of an activity is an indicator of the number of students expected to attend and hence the capacity of location required to accommodate the activity. The planned size can be set using the spin button control, or by typing, to any positive integer.

The check box labelled “Use planned size” is checked by default and indicates that the planned size should be used when searching for available locations or automatically allocating a location. If the user unchecks the box then the real size of the activity will be used instead. See section 3.1.9 for an explanation of real size.

3.1.7 Activity Zone

If the user does not set the zone for the activity then its location requirements may be satisfied by a location in any zone. If the user specifies a zone, then a location will only be deemed suitable for the activity if it is in the specified zone or one of the descendants of that zone (zones are hierarchical).

The user may select from any existing zone using the dropdown list but may not create additional zones; that is a function of **Enterprise Desktop reference Data Manager**.

3.1.8 Activity Module, Department, Course, Programme and Template

If the activity is to be associated with a module then it should be created from the module view. In that case, the activity will automatically be linked to the module. It will inherit its department from that of the module and will be associated with any course or programme with which the module is associated.

If the activity was generated from an activity template then the name of the template will also be shown.

The user is not able to change any of the fields described in this section, they are displayed for information only.

3.1.9 Activity Real Size

The real size of an activity is also read only information. It is calculated by summing the sizes of the student sets allocated to an activity.

If the user unchecks the box labelled "Use planned size" as described in section 3.1.6 then the real size will be used to determine the capacity of room required, rather than the planned size.

3.1.10 Activity Availability

Each activity that is generated from a module will have its availability influenced by that of the module; if the module must be taught in the first semester, for example, then all of its activities will be constrained by that.

An individual activity may also have constraints on availability. These can be set by opening the control labelled "Availability" which looks like a dropdown list. When selected the user is presented with a tool like this:

Figure 61 Activity availability

The user may make the activity unavailable for whole weeks, by deselecting those weeks from the teaching week pattern, or for specific days and times, by painting out those times in the grid.

Alternatively, the activity may be associated with a pre-defined named availability pattern by unchecking the box labelled "Use custom availability" and selecting one of the named availability patterns displayed in the list on the left of the control. The user of ET cannot create additional named availability patterns; that is a function of **Enterprise Desktop Reference Data Manager**.



It should be noted that it is unwise to constrain the availability of the activity if the constraint should really be applied elsewhere. To illustrate, suppose that Activity X must be taught by Staff Member Y who is not available on Mondays or Thursdays.

If the activity is made unavailable on Mondays and Thursdays this constraint will remain in place even though the activity is reassigned to another member of staff. If the Staff Member Y is made a preset requirement for the activity and the unavailability is applied to the staff member then the constraint will only remain in force for as long as the staff member remains a requirement of the activity.

3.1.11 Activity Groups and Tags

Associating activities with groups and tags is explained in section 2.7

3.1.12 Activity User Text

Each activity has 5 user text fields which can be used to store additional information for which there is no specific field already.



It is sensible for an institution to agree a policy on the way that user text fields are used. If each user is allowed to use these fields in their own way that can become very confusing for anyone looking at the data on an institution-wide basis. Potentially, different users will use the same field for different purposes and may use different fields for the same purpose.

3.2 Scheduling an Activity

With the unscheduled activity selected in the **Activities** spreadsheet, the *Combined Timetable* grid will display blue diamonds where the activity can be scheduled to begin. To schedule the activity automatically (allowing the scheduling engine to determine the best time using scheduling preferences) select *Activity* | *Schedule* or use the keyboard shortcut Ctrl-H.

To schedule manually (user decides which time to use) right-click with the mouse on a blue diamond and select *Schedule here*. The activity will be scheduled at the selected time.

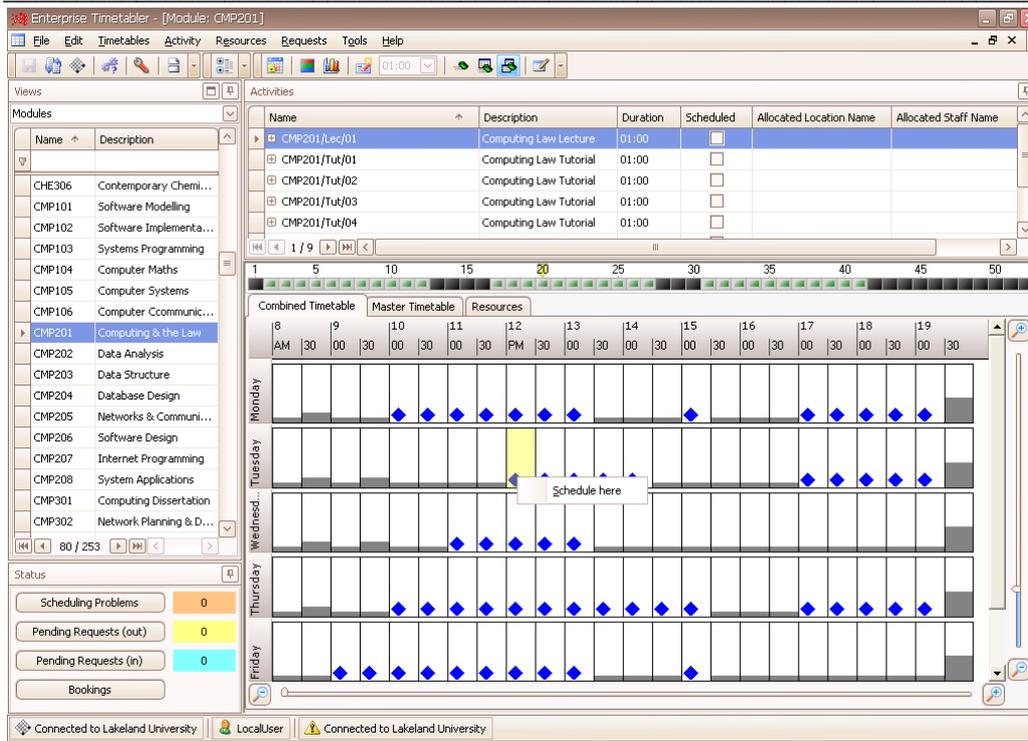


Figure 62 Scheduling an activity manually

Note that the activity schedules across the *entire* week pattern.

3.3 Scheduling a Subset of Weeks

Unscheduled activities can also be scheduled as *Activity Variants* on the **Timetable** grid. Selecting an activity, changing to **Variant Mode** using the icon on the toolbar, and then selecting weeks enables the user to schedule the activity for a single week or combination of weeks within the existing week pattern.



Figure 63 Scheduling an activity variant

In this instance, the Activity Variant will schedule into the appropriate week pattern, and in the **Activity** spreadsheet, the activity will split into its two component parts each with a different week pattern listed against the name. The activity with the *deselected* week pattern will remain unscheduled.

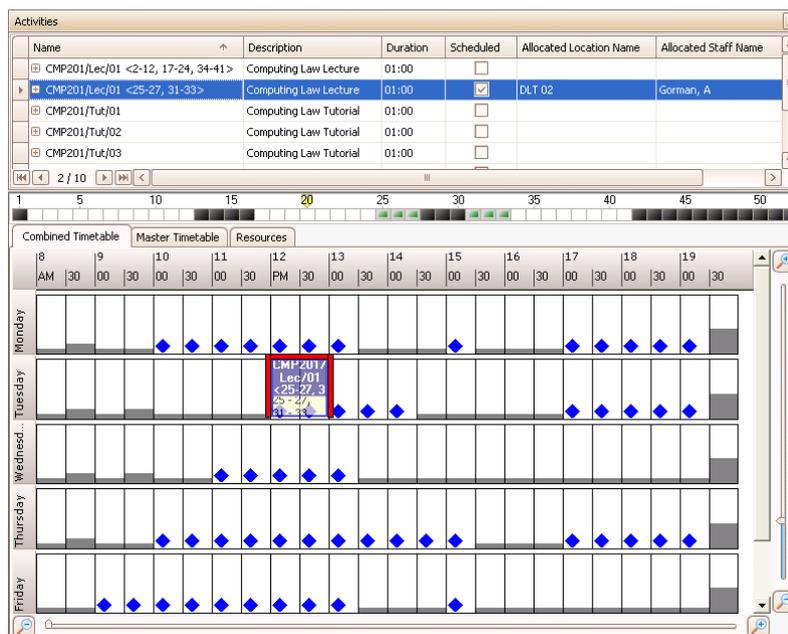


Figure 64 Timetable grid with scheduled and unscheduled variant activities

3.4 Creating and Scheduling an Activity in one Step

The user can create and schedule new activities directly onto the timetable grid in a single operation.

The user must select from the **Views** pane the object with which they wish the activity to be associated. For example, if the object selected is a location then a new activity will be created for that location, if the selected object is a member of staff then a new activity will be created for that member of staff.

Note that some objects do not allow the creation of new activities (e.g. you cannot create a new activity for a POS because the association of an activity with a POS is not direct, it is via a Module).

The user, having selected the object they wish the activity to be associated with, must also select the **Show Start Times** icon from the toolbar. This enables the blue diamonds on the timetable grid, giving the user information about where any new activities could be scheduled. It is also useful to set the **Default Period Length** from the toolbar, as the required duration of the new activity may have an effect on the position of any blue diamonds on the timetable grid.

Right-clicking on the grid at the timeslot the new activity is scheduled will change the colour of the slot and open a single action menu; *Create Activity*.

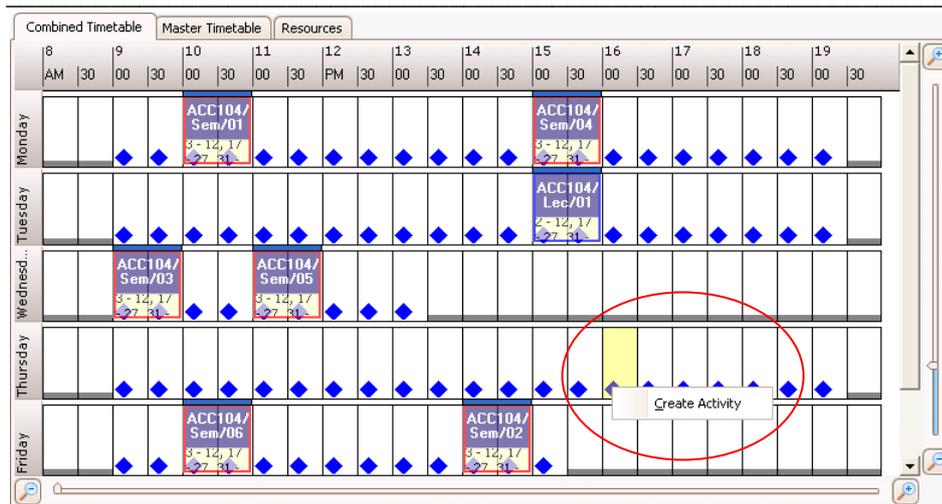


Figure 65 Creating a scheduled activity

Selecting “Create Activity” will open an **Activity Editor** window, and the details of the activity can be inserted into the relevant fields in the **Activity Editor**.

Clicking on the OK button will create an activity with the default period length, (or with a duration specified in the Activity Editor), at the selected point on the **Timetable** grid.

The outcome is a new activity which will appear on the **Timetable** grid. The activity is scheduled on the day and at the time selected. The day and time will be interpreted as suggested day and time for the activity. The new activity will also be listed in the **Activities** spreadsheet.

*There will be no resources attached to the new activity unless it was created from the viewpoint of a resource, these will need to be added using the **Resource Editor**, details of which are contained in section 0.*

3.5 Extending the Duration of a Scheduled Activity

On the **Timetable** grid, the user can extend the duration of activities by clicking and dragging on the trailing edge of the activity.

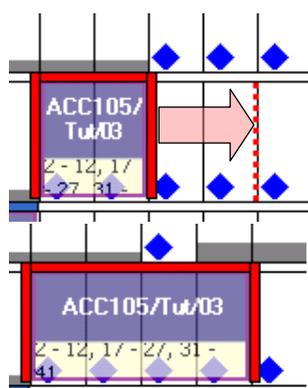


Figure 66 Extending duration

As the user begins to a red dotted line will appear indicating the maximum extent to which the duration of the activity can be increased.

Extending the duration of an activity will have an effect on the appearance of the screen. The available number of blue diamonds will change since the scheduling engine is now showing possible start times for an activity of greater duration.

In the Activities spreadsheet, assuming that the *Duration* column has been added from the Column Chooser, the duration will change to the appropriate time span.

3.6 Drag and Drop Re-scheduling

Scheduled activities can be dragged and dropped onto timeslots where appropriate resources are available. When an activity is selected, a blue diamond on the grid indicates that the activity could be moved so that it *starts* at the time indicated by the diamond. It is not necessary to search for a

contiguous set of slots sufficient to accommodate the duration of the activity. The scheduling engine is already considering the duration of the activity when it calculates possible start times.

The blue diamond indicates that there are resources available that match the requirements of the selected activity. These resources may or may not be the same resources that are currently allocated to the activity. For example, if the activity requires a tutorial room for 10 people then a blue diamond will show wherever such a room is available. Moving the time of the activity may result in the room being changed from one tutorial room to another. Caution is required here; if the user were performing the operation while looking at the timetable of a Location, dragging and dropping the activity onto a different timeslot may cause the activity to disappear from the current view, since a different location may be allocated at the new time.

If the activity has a preset requirement for a resource then a blue diamond will only appear where that resource is available.

In normal use the scheduling engine will only consider resources to which the user has **Full** permission when calculating where the activity can be moved. If the user enables **Request** mode, then an amber triangle will be shown to indicate potential start times where the user has **Request** permission to one or more of the available resources.

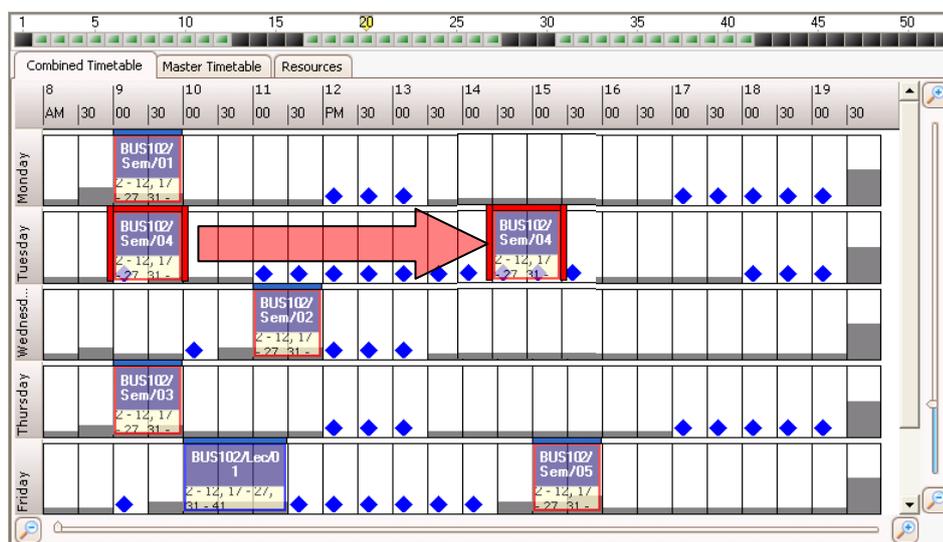


Figure 67 Using click and drag to reschedule

Unless the user has selected **Variant Mode** from the toolbar, the activity will be rescheduled into the new timeslot *over the entire week pattern*.



This capability in Enterprise Timetabler is the same technique that users employ in Syllabus Plus. However, remember that Activities can be viewed in any combination of weeks, either single or multiple, and, using Variant Mode, activities can be rescheduled using any combination of single or multiple weeks. It is therefore possible to select a single week (or combination of weeks) from the Week Pattern bar and drag the activity to a new timeslot *for that week (or combination of weeks) only*. This capability is described in the next section.

3.7 Drag & Drop Re-scheduling for Selected Weeks

The drag and drop technique can also be used in combination with **Variant Mode** and the **Week Pattern** bar to reschedule the activity into a different timeslot for a selection of weeks from the activity week pattern. This is referred to as creating Activity Variants.

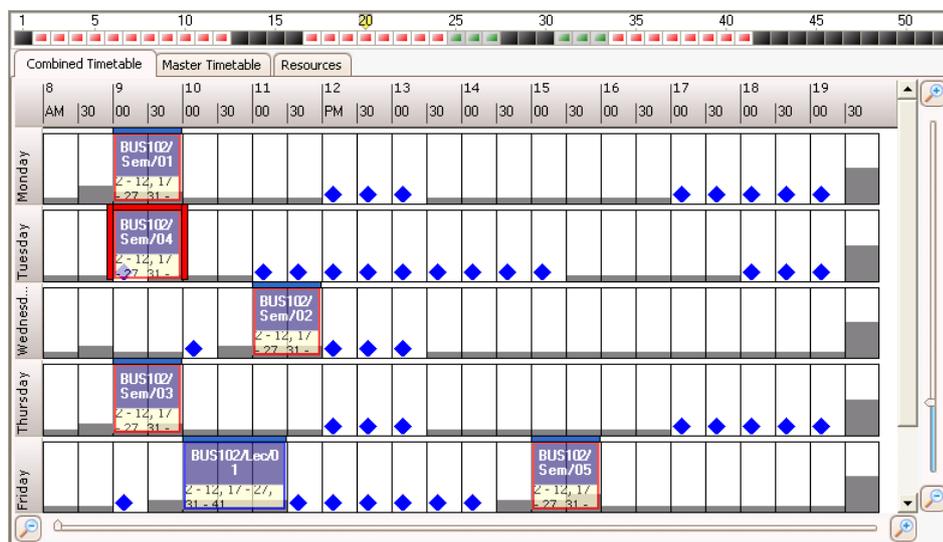


Figure 68 Timetable grid in variant mode

Clicking and dragging across the scheduled weeks of the activity in the **Week Pattern** bar when in **Variant Mode**, the user can *deselect* the weeks of the activity which are to remain scheduled in the current timeslot, (the *deselected* weeks will change from green to red).

The action of dragging and dropping the activity will now create two Activity Variants. One of these (represented by the deselected weeks (in red)) will remain scheduled at the original time. The other will be scheduled at a different time during the weeks that are *selected*, (these will be green). Once the Activity Variants have been created, **Variant Mode** will automatically switch off and the **Week Pattern** bar will revert to the week pattern for the selected variant.

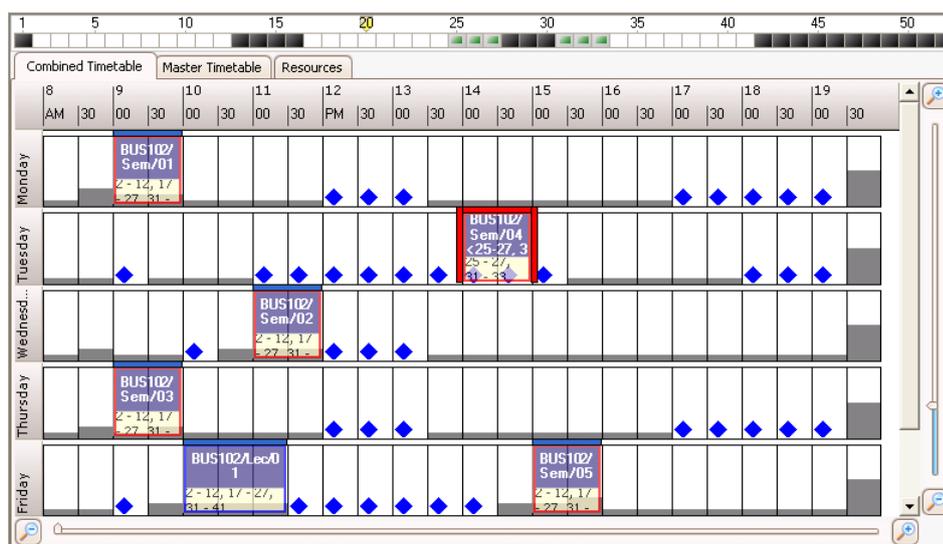


Figure 69 Activity variant after rescheduling

The **Activities** spreadsheet will now show the two variants of the activity (one changed, the other unchanged) and the name of each activity will change to show amended week patterns.

Using control and click, both activities can be selected at the same time in the **Activities** spreadsheet, and the **Week Pattern** bar and the **Timetabling** grid will show the both variants as shown below.

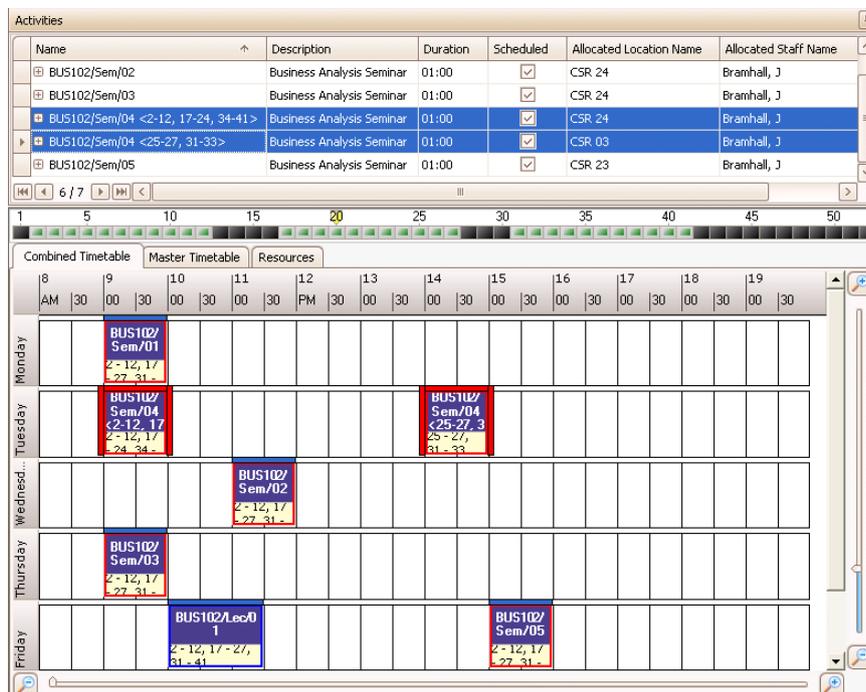


Figure 70 Timetable grid showing two variant activities

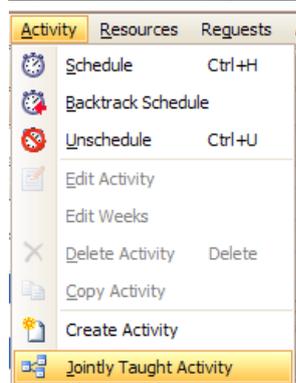


This process has an effect in Syllabus Plus as well as in Enterprise Timetabler. When the original activity is effectively split into two activities each with different week patterns, the original activity in Splus becomes a “parent” activity, is unscheduled, and is “hidden”. The two new Activities become “children” of the parent and are scheduled into the appropriate timeslots with their respective week patterns.

3.8 Creating a Jointly-Taught Activity

Where two or more modules have activities where students are taught together (they are in the same location, taught by the same person but believe that they are attending different modules) the user can create a single jointly-taught activity that represents the use of resources. The jointly-taught activity has, as its parents, activities that are associated with the separate modules being delivered.

Select the activity that will be deemed the primary activity of the jointly taught combination. The jointly-taught activity about to be created will inherit its name, day / time and resource requirements from the primary activity.



From the **Activity** drop-down menu, select *Jointly Taught Activity*.

Figure 71 Activity menu

This selection opens the **Jointly Taught Activity** window. The *Activity Name* at this point is the same as the *Primary Activity*.

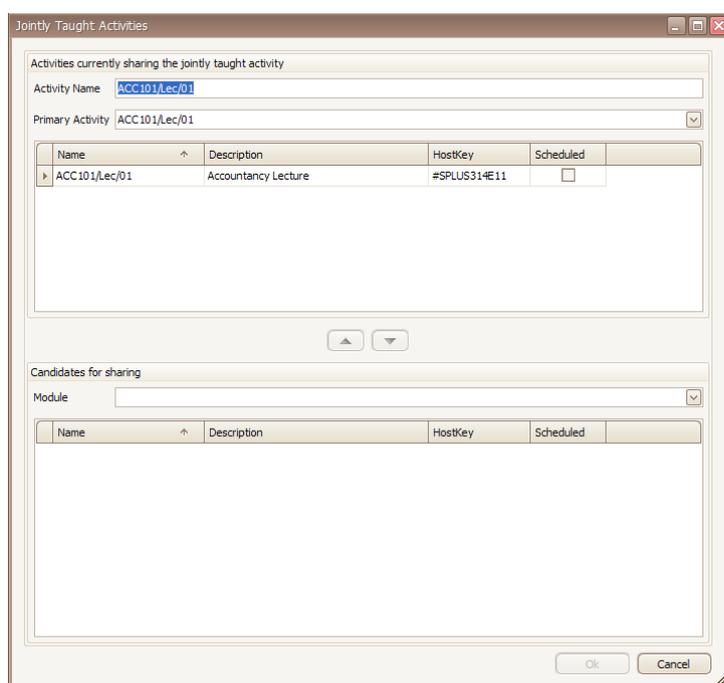


Figure 72 Jointly Taught Activities window

In the *Candidates for sharing* section of the window, clicking on the  button in the Module field opens a window containing a list of modules.

| Name | Description | HostKey | Scheduled |
|--------|-------------|---------|-----------|
| ACC307 | | | |
| ACC308 | | | |
| BUS101 | | | |
| BUS102 | | | |
| BUS103 | | | |
| BUS104 | | | |
| BUS105 | | | |
| BUS106 | | | |
| BUS107 | | | |
| BUS108 | | | |
| BUS201 | | | |
| BUS202 | | | |
| BUS203 | | | |

Select the Module which owns the activity that is to be jointly taught with the *Primary Activity*.

Selecting the Module will populate the *Candidates for sharing* section with the activities belonging to the selected Module.

The activity the user wishes to share with the *Primary Activity* can be selected from the list. Any number of activities from different modules can be added to the jointly-taught relationship in this way.

Figure 73 Module selection list

Clicking on the transfer button () allows the user to move the activity from the *Candidates for sharing* section to the *Jointly Taught Activities* section above.

The *Activity Name* can be changed to reflect the required name of the new jointly taught activity

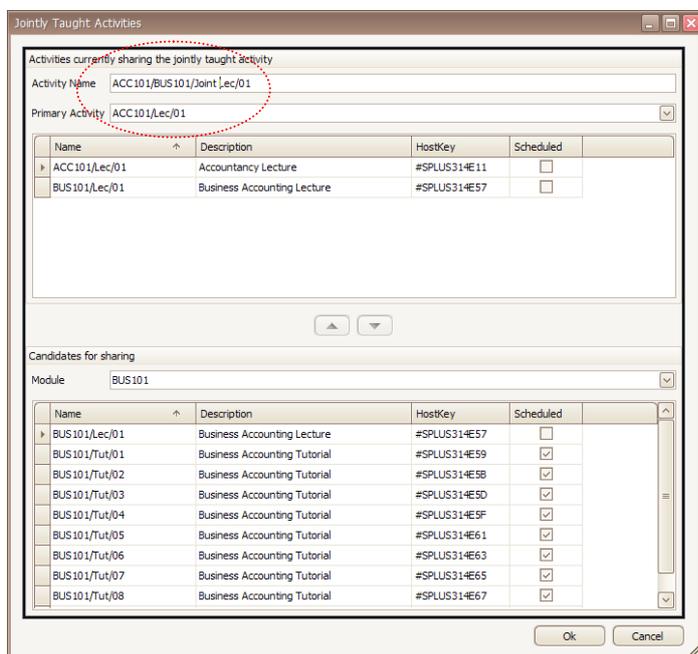


Figure 74 Jointly Taught Activities window

Clicking on the OK button will create a jointly taught child activity which can then be scheduled at an appropriate point on the timetable.

The screen will then appear as shown below:

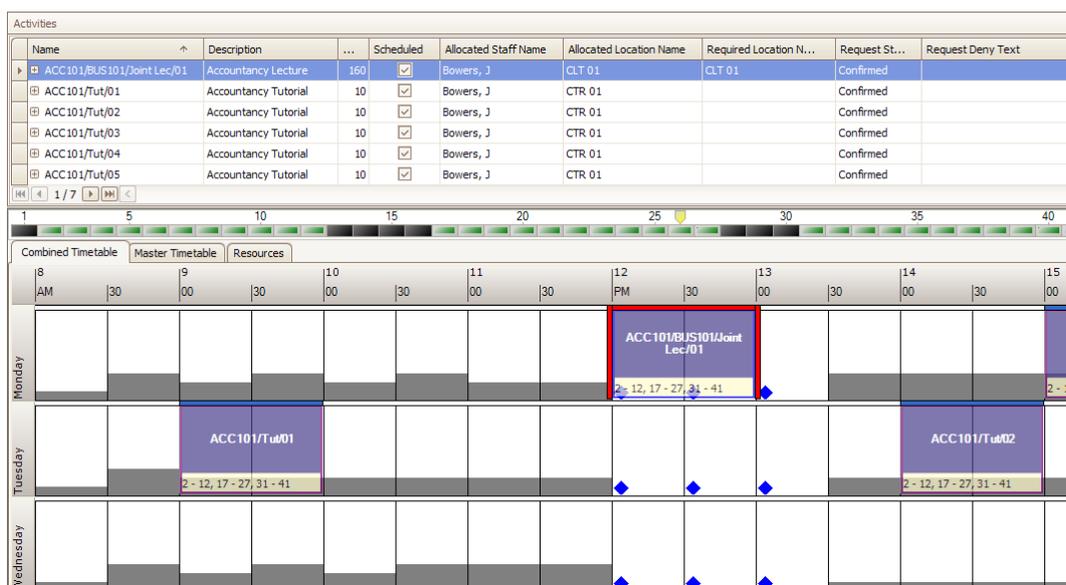


Figure 75 Jointly taught child activity

The size of the jointly-taught child activity will be the sum of the sizes of the parent activities being joined. The jointly-taught child activity will therefore require a location of sufficient capacity to accommodate all of the original activities being joined.

The jointly-taught activity will appear in the timetable for all of the modules with which the parent activities are associated.



This process has an effect in Syllabus Plus as well as in Enterprise Timetabler. When a jointly taught activity is created it becomes a “child” of all of the activities that were joined. The “parent” activities are not scheduled. They serve as a placeholder linking the child activity to multiple modules. The child activity holds the resources thus avoiding the issue of deliberate double bookings.

3.9 Drag and Drop in Master Timetable

The drag and drop operation has a slightly different connotation when working in the *Master Timetable* tab. Movement in the horizontal direction will change the day / time of the selected activity, whereas movement in the vertical direction will change the resource allocated to the activity.

In the example illustrated below, three *Locations* have been highlighted in the **Views Pane**, the *Master Timetable* tab has been selected, and an *Activity* has been chosen in the **Activities** spreadsheet.

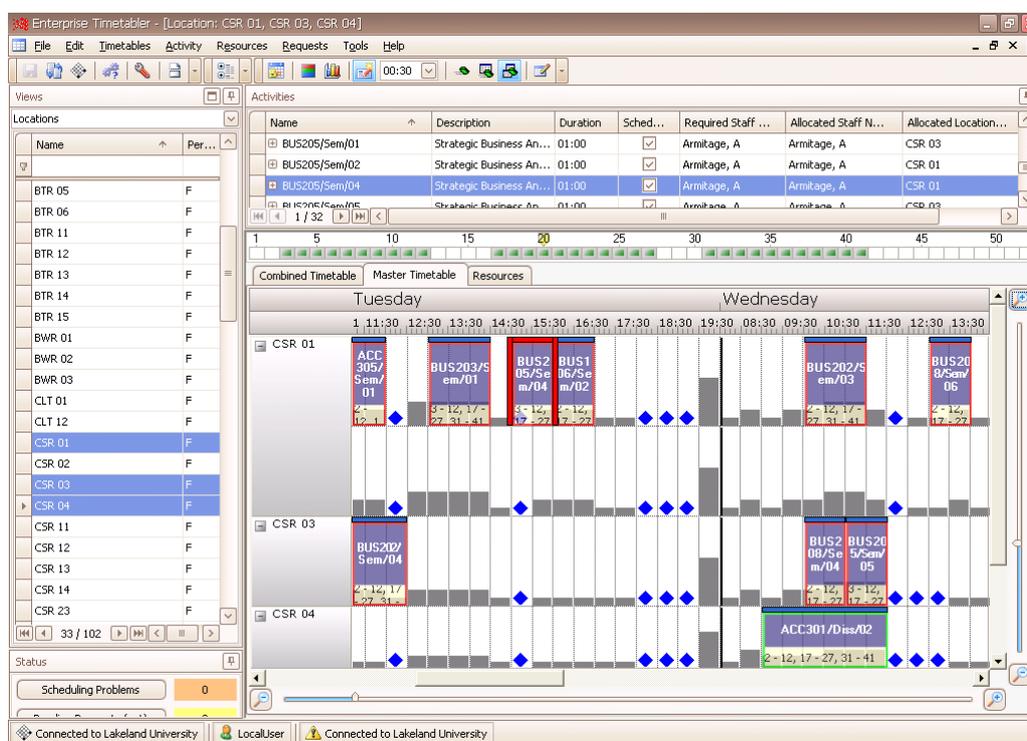


Figure 76 Master Timetable

Selection of the activity will activate the blue diamonds on the **Timetable** grid, showing the timeslot availability across all the rooms for the whole week. Remember, the room which the activity is being transferred to must be both available *and* suitable. If, for example the room is too small or not suitable, there will be no blue diamonds showing and the slots will be “greyed out”.

The activity can be dragged using the mouse, and dropped into an available timeslot *in any of the selected locations*.

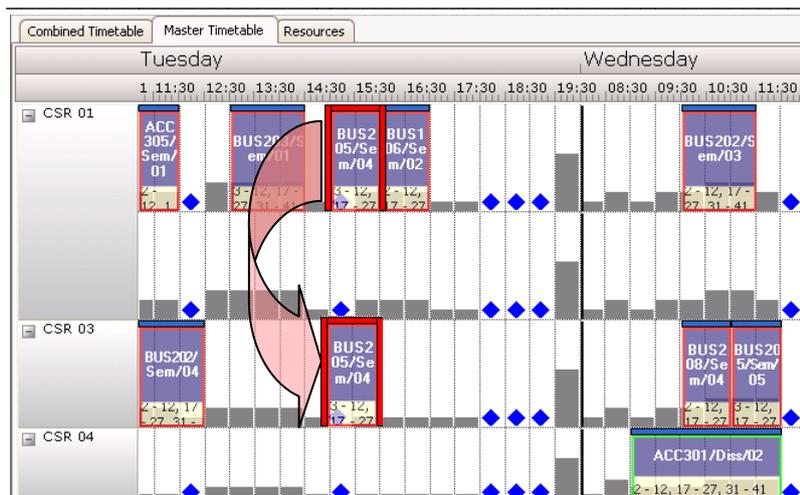


Figure 77 Drag and drop to change resource allocation

The activity will then move from the allocated location to the new location *for the entire allocated week pattern*. If the activity is to be relocated for one week only (or a combination of weeks), the user would carry out the same process using **Variant Mode** and ensuring that the correct weeks were selected and deselected as appropriate. Dragging and dropping with a limited selection of weeks will then create Activity Variants.



This capability is unlike any of the processes available within Syllabus Plus, with the closest comparison being Master Timetable printouts in the Syllabus Plus printing system. There are numerous uses for this process, in particular the need to empty a particular location over a period of weeks for refurbishment. Users can easily select the alternative locations they wish to use and relocate activities quickly to available and suitable timeslots.

4 Using the Resource Editor

The *Combined* and *Master* timetable tabs both allow the editing of activities using drag and drop operations, but with limited control over resource allocation. The *Combined* timetable will show a blue diamond indicating that the selected activity can be moved to a different timeslot and, provided the resources are preset, nothing will change. However, where the resources are wildcarded, there is no guarantee that changing a timeslot will not change the location, the staff member, or the items of equipment allocated to the activity.

The *Resource Editor* allows the user greater control over scheduling changes and resource allocation. The user must first select the activity they wish to edit, and then select the *Resource Editor*.

| Requirements | Current | Available |
|------------------|-----------|--|
| Day | Thursday | <input checked="" type="checkbox"/> Keep |
| Time | 16:00 | <input checked="" type="checkbox"/> Keep |
| Location | CSR 11 | <input checked="" type="checkbox"/> Keep |
| Staff | Foster, D | <input checked="" type="checkbox"/> Keep |
| Equipment | | <input checked="" type="checkbox"/> Keep |

Figure 78 Resource tab

When the tab is opened, the *Keep* tickboxes have ticks against the scheduled Day and Time, and the activity resources; Location, Staff and Equipment.

The user must choose which aspect of the activity, (or combination of aspects), they wish to edit.

If, for example the user wishes to adjust only the location, the user starts by unticking the *Keep* tickbox against **Location**.

The **Location** section will then open up to reveal a location editor.

| Requirements | Current | Available |
|------------------|-----------|--|
| Day | Thursday | <input checked="" type="checkbox"/> Keep |
| Time | 16:00 | <input checked="" type="checkbox"/> Keep |
| Location | CSR 11 | <input type="checkbox"/> Keep |
| Staff | Foster, D | <input checked="" type="checkbox"/> Keep |
| Equipment | | <input checked="" type="checkbox"/> Keep |

Figure 79 Resource tab showing location detail

The editor is split into three columns; the first showing the requirements of the activity, the second showing the current allocation, and the third showing the available time/resource.

4.1 Requirements Column

4.1.1 Defining a flexible requirement for resources

Where the activity has requirements that could be satisfied by a number of resources, the choice of resource can be left to the scheduling engine by defining a flexible or “wildcard” requirement.

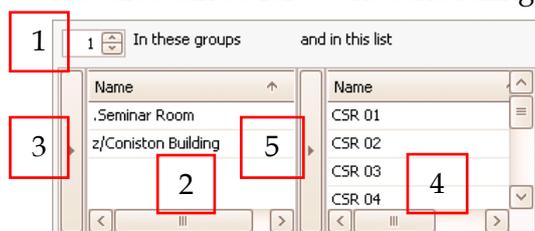


Figure 80 Flexible requirement

- 1 Using the control in the top left-hand corner, the user can indicate the number of resources of the type that are needed. In the example shown the requirement is for one location.
- 2 The resources must have the Suitability(ies) shown in this list, (In these groups).
- 3 Clicking on this button will open a window which allows Suitabilities to be added and removed as required.

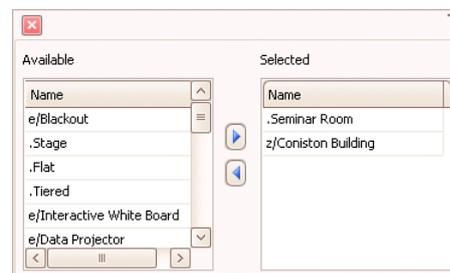


Figure 81 Editing suitabilities



This control is similar to the *Suitabilities* tab of the Activities window in Syllabus Plus but aims to overcome the limitations of that tab. In Splus, *all* suitabilities are shown on the tab with those applied to the activity highlighted in blue. Where there is a long list, not all selections can be seen at once. The list in ET is designed to allow the user to see only the selected suitabilities applicable to the chosen activity and the long list only becomes available if required by the user.

- 4 The second list in the requirements column shows the list of resources that pass the screening test for suitability. In the case of Locations, for example, the requirements of size and zone will also be considered when the list is assembled. It should be noted that the list shows the resources that are suitable, *without* reference to availability.

- 5 The user can manually screen the list further. Clicking on this button allows the user to add or remove items from the screening list whether or not they satisfy the criteria specified by the Suitability(ies) list. For example, a user may require a Lecture Theatre with blackout, *but not* Lecture Theatre X. The lecture theatre could be removed from the list manually.

When the user creates a custom screening list in this way, the selected suitabilities are removed since they are no longer an accurate representation of the requirements of the activity.

4.1.2 Defining a requirement for fixed resources

The user may also indicate that the resource requirement is fixed or “preset” by selecting resources directly from the list (4). If one or more items are selected then the number required control (1) will be greyed out and set to the number of resources selected from the list.

To change the requirement without making further changes to the activity, click the **Change Requirement** button. If the activity is currently unscheduled, the requirement will be changed and will now become a scheduling constraint. Blue diamonds will only show at time slots where the requirements can be met. If the activity is currently scheduled, the selected resource will be allocated as well as becoming a requirement for the activity. Working this way forces the allocation regardless of the availability of the resource at the required time, so has the potential to create a double-booking of that resource. If a double booking is created, this will appear in the **Status** panel as an additional *Scheduling Problem*.

4.1.3 Available Column

Having defined the requirements, clicking on the **Search** button at the bottom of the *Resource Editor* will activate the third column; show available time/resource list.

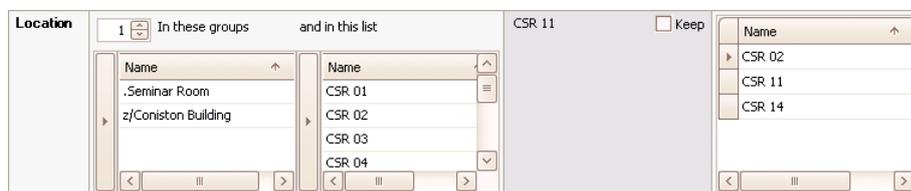


Figure 82 Available resources

This column takes the *range* of the list (4) as the basis for the search regardless of the selection. The assumption is that the user is searching for all suitable and available resources so any preset requirement can be ignored for the purpose of the search.

The show available time/resource list shows the resources that are suitable *and* available at the time at which the activity is scheduled. The user can select any resource from the show available time/resource list and click **Schedule** to change the allocation.

Where the currently allocated resource is preset, the allocation of a different resource from the available resource list will replace the preset resource so that requirement and allocation are both changed. If the original resource was not preset, the new resource is allocated as a wildcard resource. In this case the requirement is not changed.



This control is similar to the *Resource Reallocation Palette* in *Syllabus Plus*, but with an important difference. In *Syllabus Plus*, if the resource is “preset” that is interpreted as “the activity *must* have this resource”. Therefore, in *Syllabus Plus*, you must change the requirement to a wildcard before you can allocate a different resource. Enterprise Timetabler assumes that if you select a different available resource then you wish to change the requirement as well as the allocation of the currently preset resource.

The current allocation column of the editor will update to show the newly allocated resource(s).

4.1.4 Flex Location with Time

Clicking on the button at the bottom of the *Resource Editor* to activate the available time/resource list may reveal a position where no alternative resources are available at the currently scheduled time. In this case, the user may wish to search for a different time when alternative resources are available.

Untick the *Keep* tickbox against **Time**.

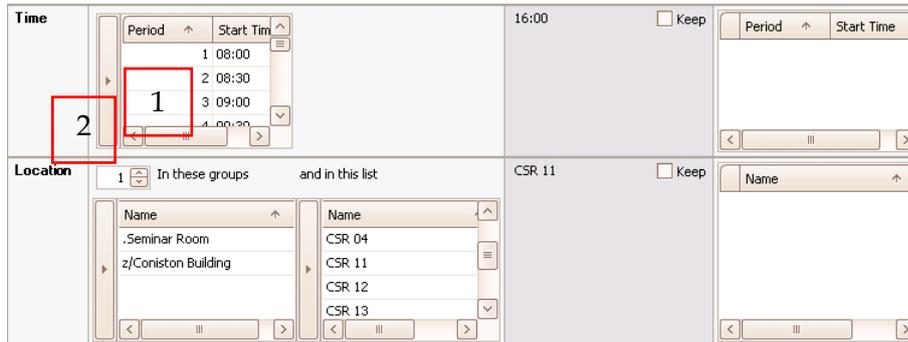


Figure 83 Allowing time to flex

- 1 The user can now see listed the requirements for time. The range of the list will default to all the times of the day, and any *Suggested Time* will be shown as selected.
- 2 As with the resource screening list, the user can alter the range of the list manually by clicking on this button. For example, a suitable alternative time may be sought but *not before* 09.00.

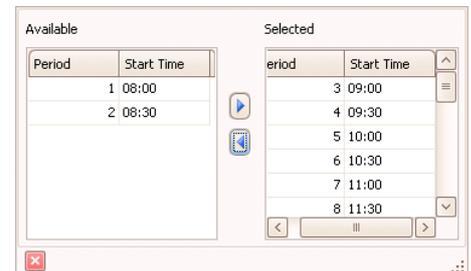


Figure 84 Adjusting the search range

The full range of the list is put forward into the search regardless of any suggested time. The user has already indicated their willingness to change the time by unticking the *Keep* box and initiating a search.

On clicking the button, the available times list will appear. The list shows any available time when the activity can be scheduled with the current resources where the *Keep* box is still ticked, and a suitable resource where the *Keep* box is unticked. The available resource list shows any suitable resource that is available at one or more of the available times. No time and no resource are selected.

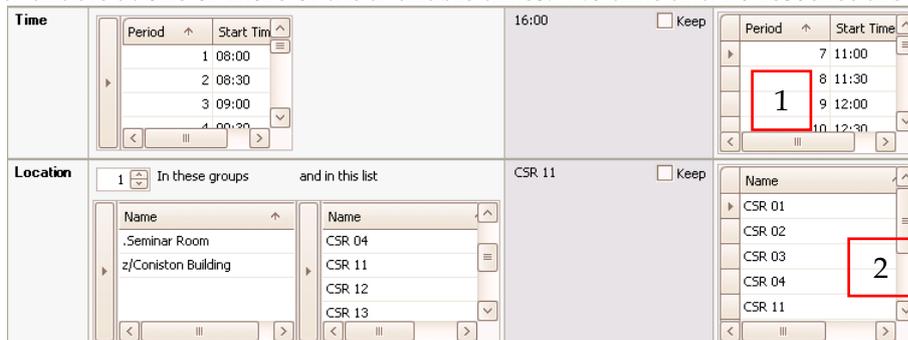


Figure 85 Interaction of lists

Both lists interact with one another, and the user can therefore decide which selection is most important.

- 1 The available time list shows the user that the activity could be scheduled at any of the displayed times using a location from list (2).
- 2 The available resource list shows the user that any of the displayed locations could be used for the activity at one or more of the displayed times in the available time list (1).

If the user selects a time, the location list will update to show available locations at the selected time. If the user selects a location, the times list will update to show the times at which the selected location is available. The user should select the most important factor first.

4.1.5 Flex Staff with Day and Time

In the event that there are still no alternative resources available, the user might decide to search for availability on a different day.

In this case the *Keep* tickbox against **Day** would need to be unticked.

| Day | <input type="text" value="Day"/> <ul style="list-style-type: none"> Monday Tuesday Wednesday | Thursday | <input type="checkbox"/> Keep | <input type="text" value="Day"/> | | | | | | | | | | | | | | |
|-----------------|--|----------|--|----------------------------------|-------------------------------|--|-------|-----------|---------|---------|---------|-------|-------------------------------|--|--------|------------|--|--|
| Time | <table border="1"> <thead> <tr> <th>Period</th> <th>Start Time</th> </tr> </thead> <tbody> <tr><td>1</td><td>08:00</td></tr> <tr><td>2</td><td>08:30</td></tr> <tr><td>3</td><td>09:00</td></tr> <tr><td>4</td><td>09:30</td></tr> </tbody> </table> | Period | Start Time | 1 | 08:00 | 2 | 08:30 | 3 | 09:00 | 4 | 09:30 | 16:00 | <input type="checkbox"/> Keep | <table border="1"> <thead> <tr> <th>Period</th> <th>Start Time</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> </tbody> </table> | Period | Start Time | | |
| Period | Start Time | | | | | | | | | | | | | | | | | |
| 1 | 08:00 | | | | | | | | | | | | | | | | | |
| 2 | 08:30 | | | | | | | | | | | | | | | | | |
| 3 | 09:00 | | | | | | | | | | | | | | | | | |
| 4 | 09:30 | | | | | | | | | | | | | | | | | |
| Period | Start Time | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Location | | CSR 11 | <input checked="" type="checkbox"/> Keep | | | | | | | | | | | | | | | |
| Staff | <input type="text" value="1"/> In these groups and in this list <table border="1"> <thead> <tr><th>Name</th></tr> </thead> <tbody> <tr><td> </td></tr> </tbody> </table> | Name | | Foster, D | <input type="checkbox"/> Keep | <table border="1"> <thead> <tr><th>Name</th></tr> </thead> <tbody> <tr><td>Foster, D</td></tr> <tr><td>Hall, M</td></tr> <tr><td>King, J</td></tr> <tr><td>Reid, M</td></tr> </tbody> </table> | Name | Foster, D | Hall, M | King, J | Reid, M | | | | | | | |
| Name | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Name | | | | | | | | | | | | | | | | | | |
| Foster, D | | | | | | | | | | | | | | | | | | |
| Hall, M | | | | | | | | | | | | | | | | | | |
| King, J | | | | | | | | | | | | | | | | | | |
| Reid, M | | | | | | | | | | | | | | | | | | |

Figure 86 Allowing day, time and staff to flex

The day list uses the same principles as the time list. The range of days to be included in any search can be manually edited, suggested days will be shown as selected, but do not limit the scope of the search.

Clicking the button will show the results of the search.

| | | |
|--|---|---|
| Day Day Monday Tuesday Wednesday | Thursday <input type="checkbox"/> Keep | Day Tuesday Wednesday Thursday |
| Time Period Start Time 1 08:00 2 08:30 3 09:00 4 09:30 | 16:00 <input type="checkbox"/> Keep | Period Start Time 7 11:00 8 11:30 9 12:00 10 12:30 |
| Location | CSR 11 <input checked="" type="checkbox"/> Keep | |
| Staff In these groups and in this list Name Foster, D Hall, M King, J Reid, M | Foster, D <input type="checkbox"/> Keep | Name Archer, A Black, I Bowers, J Bunting, P Conway, K |

Figure 87 Day, time and staff list

- 1 The day list shows any day on which there is at least one time when the activity could be scheduled with suitable resources.
- 2 The time list shows any time at which the activity could be scheduled on at least one of the days, with suitable resources
- 3 The resource list shows any suitable resource which is available on at least one of the day and time combinations.

The available day, time and resource lists interact with each other so that the user may select the most important criteria first. Selecting a day will update the times list to show only the available times on that day, and the resource list will update to show the staff that are available at one or more of the available times on the selected day.

| Day | <input type="button" value="Day"/> <ul style="list-style-type: none"> Monday Tuesday Wednesday | Thursday | <input type="checkbox"/> Keep | <input type="button" value="Day"/> <ul style="list-style-type: none"> Tuesday | | | | | | | | | | | | | | | | | | | | |
|-----------------|--|----------|--|--|---------|---------|-----------|-------------------------------|---|---|-------|-------|-------------------------------|---|--------|------------|---|-------|----|-------|----|-------|----|-------|
| Time | <input type="button" value="Period"/> <table border="1"> <thead> <tr> <th>Period</th> <th>Start Time</th> </tr> </thead> <tbody> <tr><td>1</td><td>08:00</td></tr> <tr><td>2</td><td>08:30</td></tr> <tr><td>3</td><td>09:00</td></tr> <tr><td>4</td><td>09:30</td></tr> </tbody> </table> | Period | Start Time | 1 | 08:00 | 2 | 08:30 | 3 | 09:00 | 4 | 09:30 | 16:00 | <input type="checkbox"/> Keep | <input type="button" value="Period"/> <table border="1"> <thead> <tr> <th>Period</th> <th>Start Time</th> </tr> </thead> <tbody> <tr><td>9</td><td>12:00</td></tr> <tr><td>10</td><td>12:30</td></tr> <tr><td>11</td><td>13:00</td></tr> <tr><td>12</td><td>13:30</td></tr> </tbody> </table> | Period | Start Time | 9 | 12:00 | 10 | 12:30 | 11 | 13:00 | 12 | 13:30 |
| Period | Start Time | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 08:00 | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 08:30 | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 09:00 | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 09:30 | | | | | | | | | | | | | | | | | | | | | | | |
| Period | Start Time | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 12:00 | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 12:30 | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 13:00 | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 13:30 | | | | | | | | | | | | | | | | | | | | | | | |
| Location | | CSR 11 | <input checked="" type="checkbox"/> Keep | | | | | | | | | | | | | | | | | | | | | |
| Staff | <input type="button" value="1"/> In these groups and in this list <table border="1"> <thead> <tr><th>Name</th></tr> </thead> <tbody> <tr><td>Foster, D</td></tr> <tr><td>Hall, M</td></tr> <tr><td>King, J</td></tr> <tr><td>Reid, M</td></tr> </tbody> </table> | Name | Foster, D | Hall, M | King, J | Reid, M | Foster, D | <input type="checkbox"/> Keep | <input type="button" value="Name"/> <ul style="list-style-type: none"> Archer, A Black, I Bowers, J Bunting, P Conway, K | | | | | | | | | | | | | | | |
| Name | | | | | | | | | | | | | | | | | | | | | | | | |
| Foster, D | | | | | | | | | | | | | | | | | | | | | | | | |
| Hall, M | | | | | | | | | | | | | | | | | | | | | | | | |
| King, J | | | | | | | | | | | | | | | | | | | | | | | | |
| Reid, M | | | | | | | | | | | | | | | | | | | | | | | | |

Figure 88 Day, time and staff list interaction

4.1.6 Flexing Multiple Resources and Day / Time

In the case where the user still finds no suitable resource is available, it may be necessary to allow other resources to change. For example, there may be no alternative member of staff available because the user is keeping the current location, and at the times when the location is free there is no member of staff available. By unticking the *Keep* box against **Location**, the user indicates willingness to accept an alternative room if this makes it possible to find an alternative time when there is an alternative member of staff available.

Resource lists will now interact with each other as well as the day and time lists. If the user picks a new location, the day list will update to show days when that location is available on at least one of the available times. The time list will update to show times when the location is available on at least one available day. The staff list will update to show members of staff that are available for at least one of the available day and time combinations.



It is only necessary to use this sophisticated functionality to solve difficult scheduling / allocation problems where the user wishes to keep tight control of the resources being allocated. When many degrees of flexibility are allowed it should be expected that the search will take a significant time (but usually seconds rather than minutes) since the scheduling engine is inspecting many possible solutions to the scheduling problem in order to report back the viable ones. For example, if there are 3 days, 6 periods, 5 locations and 3 staff that might satisfy the requirements of the activity then 270 permutations of day / time / resource must be checked.

4.1.7 Activity Variants

When the user enters variant mode and selects a subset of weeks the *Resource Editor* will search for solutions for the selected weeks only. The solution will be applied to a new variant activity representing the selected weeks and a second variant will be created to represent the unchanged weeks.

4.1.8 Activities with In-week-repetition

This is a special case and causes the day controls to behave slightly differently. As there is no such concept as a wildcarded, multi-day activity, where more than one day is shown as suggested in the requirements column, the *selected* days are passed through to the search rather than the *range* as is normal. The days will also appear as selected in the resulting available days list.

When a single day is suggested, you can change the Suggested Day by selecting an alternative in the available days list, (this changes the allocated day *and* the Suggested Day *if there is one*). The only way to change multiple Suggested Days, however, is in the requirements column because you can't ask the scheduling engine to search for **X** available days where **X** is greater than 1.

4.1.9 Multiple Selection of Activities

Where more than one activity is selected the second and third columns of the resource editor become inactive. It is not possible in version 1.0 to search for a resource that is available for multiple activities or a time when multiple activities could be scheduled.

Only the requirements section will be active and any change made will overwrite the existing requirement for all the selected activities.

4.2 Editing Student Sets against Activities

The Student Set Editor is accessed from the *Resources* drop-down menu, selecting the **Edit Student Sets** option.

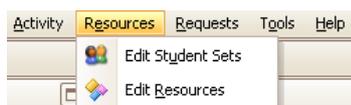


Figure 89 Edit student sets

The user should first select the activity, then go to **Edit Student Sets**.

The Student Set Editor displays the day and time of the activity, and shows two lists:

- The Student Sets that are currently 'selected' i.e. allocated to the activity.
- The names of Student Sets which are 'available' to attend the activity (i.e. Student Sets enrolled on the module of the activity and, if the activity is scheduled, not busy at the same time).

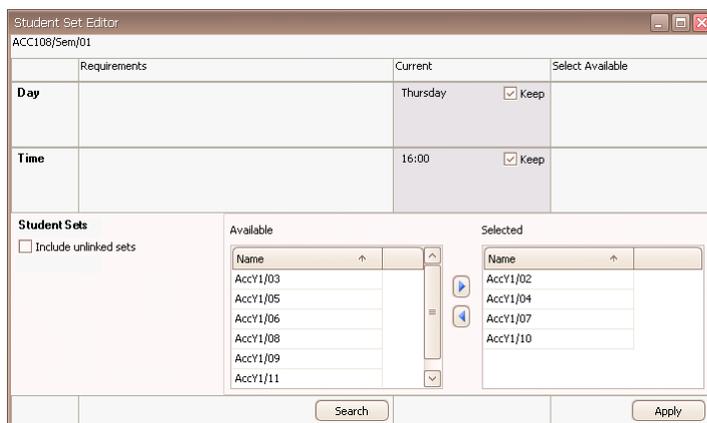


Figure 90 Student set editor

To add Student Sets to the activity, select from the *Available* list and use the arrow to add them to the *Selected* list. To remove Student Sets, use the arrow in the other direction. Click the  button.

Use the Column Chooser (right-click on the mouse) to add the Student Set planned size column if this is helpful.

The tickbox '*include unlinked sets*' allows you the option to display Student Sets which are not linked to any module



This control is similar to the *Delivery* tab of the Activities window in Syllabus Plus, but with the advantage of only displaying Student Sets that are available to attend the activity. Activity Template rules in the underlying Syllabus Plus data are still adhered to. E.g. a Student Set might be already allocated to Tutorial/01, but is 'available' to attend Tutorial/02 where both tutorials have been generated from the same Activity Template. Enterprise Timetabler will permit the user to change the allocation, but allocating the set to Tutorial/02 will automatically detach them from Tutorial/01.

Intentionally left blank

5 Automatic Scheduling

As well as scheduling activities manually, with help from the scheduling engine to check for clashes and constraints, Enterprise Timetabler allows the user, *if authorised*, to schedule automatically. Activities can be described in terms of a pure requirement; i.e. instead of scheduling using a specific day and time and using chosen resources, the user can *describe* the demand for an activity using a specified duration, attended by allocated student sets, and with the number and type of required resources identified. The scheduling engine can then be presented with a batch of activities that can be scheduled automatically.

The scheduling engine begins the automatic scheduling process by assessing the difficulty of satisfying the requirements of each activity. For example, an activity that occurs in a single week is easier to schedule than one that repeats over multiple weeks, and activity that requires a specialised room, (of which there are few), is more difficult to schedule than one that requires a general purpose room, (of which there are many). Activities are then scheduled in order of difficulty, starting with the most difficult, so as to maximize the likelihood of finding a solution for all the requirements.

When scheduling each activity, there may be several possible ways of satisfying the demand. Where this is the case, the scheduling engine uses **Scheduling Preference Strengths** to determine the most desirable solution from the user's point of view.

5.1 Automatic Scheduling Using the Views Pane

Automatic Scheduling can be undertaken by selecting individual or multiple objects from the **Views Pane**. Once an object has been selected, the *Activities* associated with the selected object or objects, as listed in the **Activities Spreadsheet**, can be *Scheduled* or *Unscheduled* using the options available in the *Activity* drop-down menu.

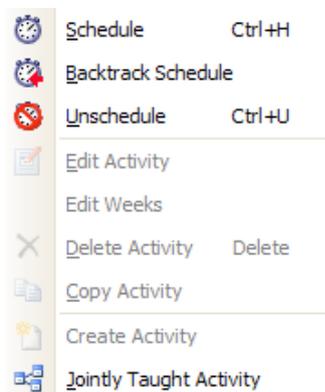


Figure 91 Activity menu

The effect will be to automatically schedule (or unschedule) *all* the activities belonging to the selected object or objects.



When multiple activities are being automatically scheduled, a window will appear containing both a progress bar, and an indication of the number of activities that are being scheduled.

Figure 92 Scheduling progress bar

When activities are being unscheduled automatically, a similar but simpler window will appear.

The user may also select one or more *Activities* from the **Activities Spreadsheet** and automatically schedule or unschedule the selection. This enables the user to part-schedule the activities belonging to an object if required.

The *Schedule* and *Unschedule* buttons can also be placed on the toolbar using the capability outlined in Section 2.2.



Figure 93 Schedule and unscheduled buttons

5.2 Adjusting Scheduling Preferences

The user is also able to influence the way the scheduling engine automatically schedules activities by adjusting the *Scheduling Preferences*. This process is undertaken by selecting *Scheduling Preferences* from the *Tools* drop-down menu.

This opens the **Scheduling Preferences** window. Scheduling Preferences can be balanced against each other to obtain the preferred schedule on the timetable when scheduling. Each of the tabs, has different preferences listed:

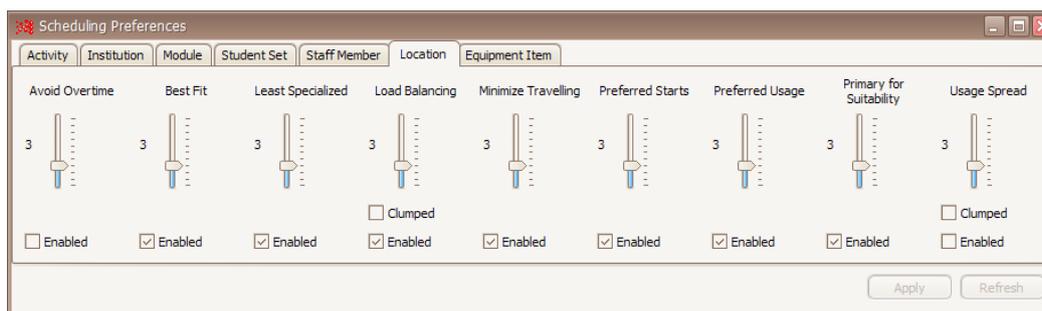


Figure 94 Scheduling preferences

A simple example of changing **Scheduling Preferences** to influence the automatic scheduling of a *Staff* timetable is illustrated below.

With the *Usage Spread* set to a higher priority the activities of the staff member will have to be scheduled evenly across the week as far as possible.

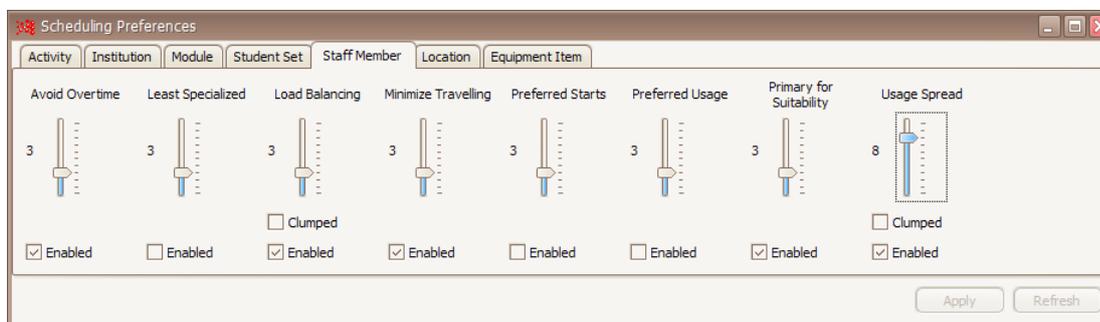


Figure 95 High priority for spreading staff activities

The outcome is shown on the *Staff Timetable Grid*:

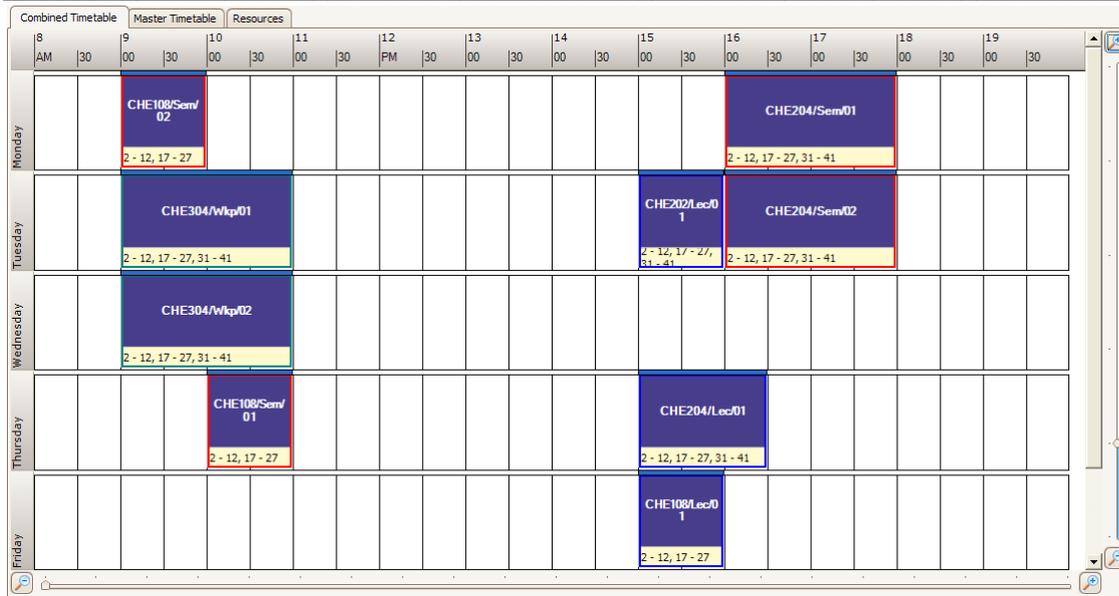


Figure 96 Result of spreading staff activities

When the *Clump* option is enabled, however, the scheduling engine will attempt to group the activities of the staff member together as far as is possible.

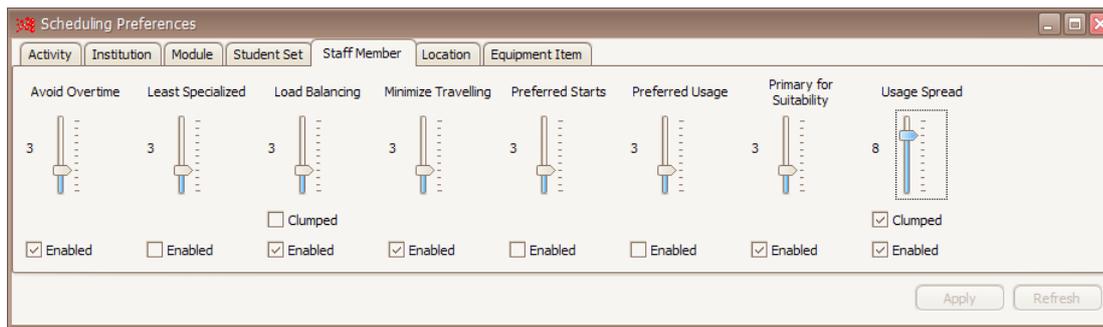


Figure 97 High priority for clumping staff activities

The outcome on the **Timetable Grid** is noticeably different:

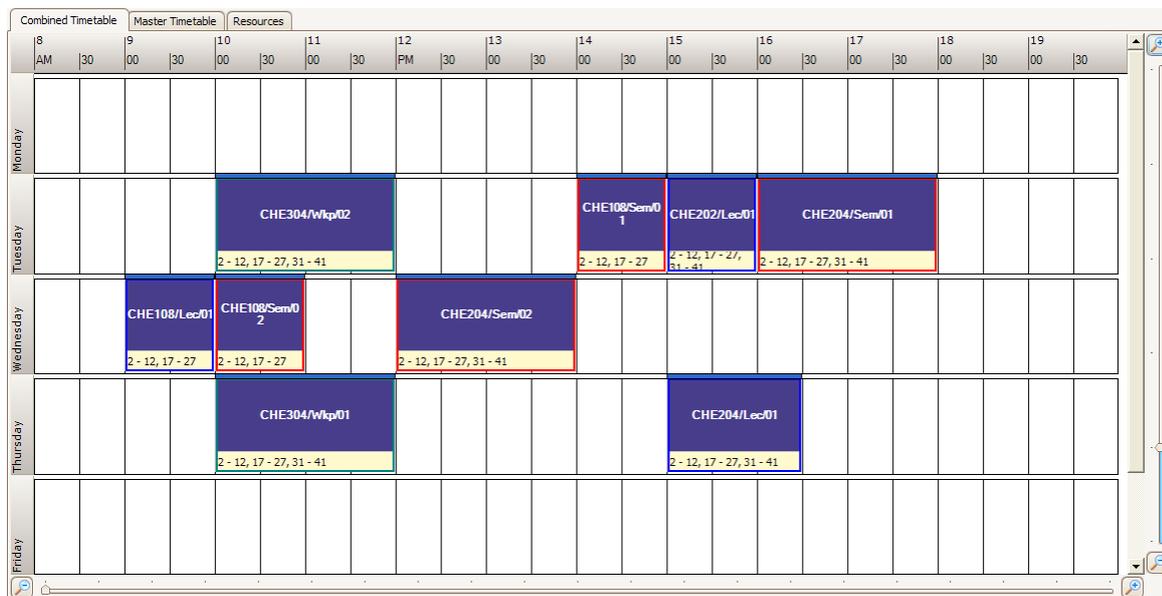


Figure 98 Result of clumping staff activities

In some cases there may be no scheduling solution that satisfies all requirements. The relative strength of each preference will determine the timetable solution chosen by the scheduling engine. For example, it may be desirable to provide full-time students with a timetable that spreads their activities evenly across the week, but Staff, on the other hand, may prefer their teaching duties to be clustered so that they have contiguous time free for research.

In addition time constraints on the Maximum Hours in a day and the Maximum Span of a working day will impose a limit on the extent of the grouping.

5.3 Using Backtracking

In addition to the *Schedule* and *Unschedule* capability, Enterprise Timetabler also provides the user with the capability to use *Backtrack Schedule*.

This option is selected from the *Activity* drop-down menu:

Backtrack Schedule is used in circumstances where the user firstly attempts to schedule a selection of activities using the normal *Schedule* command. However, because the activities could be constrained for example, by complex sequencing constraints, they may not all schedule successfully at first.

To resolve such issues, the user can try the *Backtrack Schedule* method in order to schedule the activities.

Firstly, the user should *Unschedule* the activities and then choose *Backtrack Schedule* either from the *Activity* drop-down menu, or using the appropriate icon on the toolbar if available. Using the backtracking method, the activities will schedule successfully *providing there is a scheduling solution*.

The following points should be noted by the user in relation to this operation:

- Because activities are scheduled in order of difficulty, with the most difficult first, it is possible for an activity that is *Preceding* in a sequencing relationship to be scheduled into a slot that, later in the scheduling process, does not leave sufficient time to schedule a *Succeeding* activity.
- Using the *Backtrack Schedule* method, when the scheduling engine finds an activity that cannot be scheduled in the set of activities it is currently scheduling, it will unschedule previously scheduled activities and retry until a solution is reached.
- The *Backtrack Schedule* method works best when the scheduling problem is small in scope. When scheduling a large number of activities in one operation, *Backtracking* can take a long time since there are so many permutations to be considered.

6 Constraint breaking

Users that are authorised to do so may break specified scheduling constraints. For example, suppose that a location is to be deliberately double-booked because, in special circumstances, it can be used by two or more separate groups of students for different activities occurring at the same time. Or a member of staff may be allocated to supervise two or more groups of students working in adjacent locations. To introduce these conditions into the timetable the user must override the double-booking constraints on location and staff respectively.

6.1 Constraint breaking mode

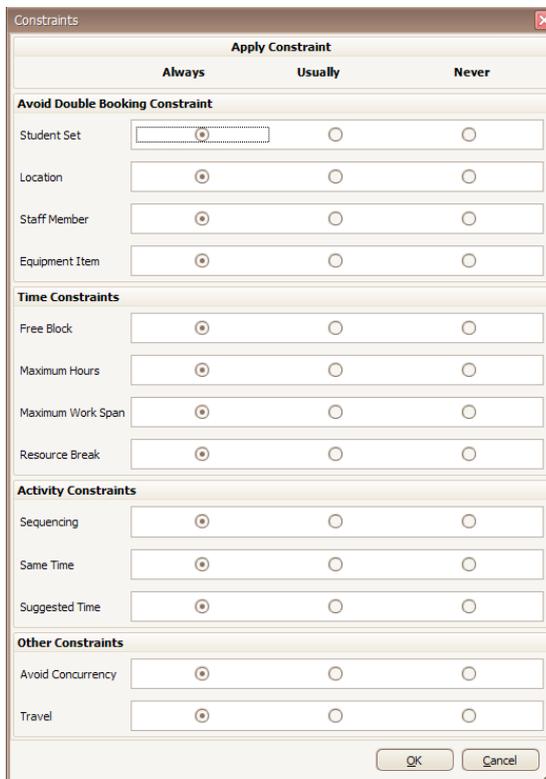
The user can enter constraint breaking mode by clicking the  button on the toolbar. This button acts as a toggle switch, turning constraint breaking mode on or off.

When the user is in constraint breaking mode this warning symbol  **Constraint Breaking Mode** will appear in the status bar at the bottom of the ET window.

While in constraint breaking mode, selected constraints will be disabled, allowing the user to deliberately create scheduling problems.

6.2 Selecting constraints to break

The user, if authorised to do so, can select which constraints will be broken when in constraint breaking mode. By selecting Tools | Constraints from the menu, the user will be presented with a window like this:



| | Always | Usually | Never |
|--|----------------------------------|-----------------------|-----------------------|
| Avoid Double Booking Constraint | | | |
| Student Set | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Location | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Staff Member | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Equipment Item | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Time Constraints | | | |
| Free Block | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Maximum Hours | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Maximum Work Span | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Resource Break | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Activity Constraints | | | |
| Sequencing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Same Time | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Suggested Time | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Constraints | | | |
| Avoid Concurrence | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Travel | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Figure 99 Constraints

If the user does not have permission to break any of the constraints listed, the controls relating to that constraint will be greyed out.

For each constraint the user has permission to break, there are 3 radio buttons allowing the user to select how that constraint should be applied. The options are to apply the constraint “Always”, “Usually” or “Never”.

6.2.1 Always

If the user chooses to apply the constraint always then moving into constraint-breaking mode will make no difference as far as that constraint is concerned. It will still be applied.

6.2.2 Usually

If the user chooses to apply the constraint usually then the constraint will be applied when operating normally but will be relaxed when the user moves to constraint-breaking mode.

6.2.3 Never

If the user chooses never to apply the constraint then it will be relaxed even when operating in normal mode. For example, it may be that the member of staff associated with each activity is the person responsible for organising the delivery rather than the person who actually delivers the teaching. In such a case, staff double-bookings would be common and should not constrain the timetable so the user may choose to ignore this constraint all the time.

This is not a good way to work, as the user then fails to obtain the advantage of clash-free timetables for staff that could be gained by adding accurate detail about who delivers which activities but the user may have no choice in the matter.

6.3 Problem warning

Whenever the user creates an additional scheduling problem or problems, a warning will appear on screen indicating that the problem count (permanently displayed in the status pane) has increased. The message will indicate the previous number of problems and the current number of problems.

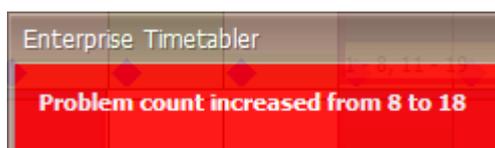


Figure 100 Problem warning

The window will appear and, after a short delay, disappear. The default position is in the middle of the screen but while the window is visible the user may drag it to any position on screen. The position will be remembered the next time the window appears.

7 Problem Waivers

Enterprise Timetabler allows the user, *if authorised*, to break scheduling constraints. There is also the potential for data to change after scheduling. The capacity of a location might be reduced by adding tables, with the result that it is no longer adequate for the size of the scheduled activity. Furthermore, the *Real Size* of an activity may be greater than its *Plan Size* so that switching to use *Real Size* causes the location to be seen as too small. In all such cases a **Scheduling Problem** is created. The presence of a problem indicates some kind of inconsistency in the scheduling data; a location that is too small, a member of staff who is double-booked or exceeding their contracted hours etc..

While some **Scheduling Problems** require a remedy, others can be overlooked. For example, it may be considered acceptable to accommodate a class of 102 students in a lecture theatre that has a capacity of 100 on the assumption that it is unlikely that all the students will attend on any given week and some students may drop the subject after the first few weeks. Moreover, a staff member may agree to work a few hours in excess of what is dictated by their contract over a short period in exchange for time off later in the year.

In cases where the problem can be overlooked, the user may, *if authorised*, create a **Waiver**. When a problem is waived the user must add some text explaining why it is acceptable for the problem to be tolerated. Enterprise Timetabler will record the date and time when the problem was waived and the user name of the person who created the waiver.

7.1 Finding & Resolving Problems

The number of scheduling problems is indicated in the **Status Pane**.

Clicking on the **Scheduling Problems** button allows the user to view the **Scheduling Problems** in the **Views Pane**. This enables the *Activity Filter* and opens the *Status* tab to display the problems.

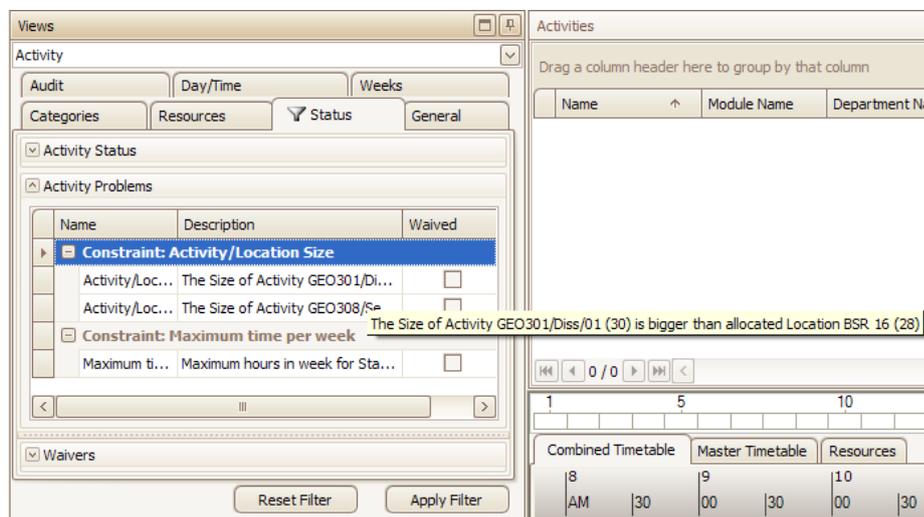


Figure 101 Problems list

The full problem description can be viewed either by extending the width of the **Views Pane** or by hovering the mouse over the *Description* field. In the example illustrated above, there are two *Activity/Location Size Constraint* problems and one *Maximum time per week Constraint* problem.

Selecting a problem by clicking on the appropriate row, and then clicking on the **Apply Filter** button will update the **Activities Spreadsheet** to show the activities involved in the selected problem. The same activities will also be displayed in the **Timetable Grid**.

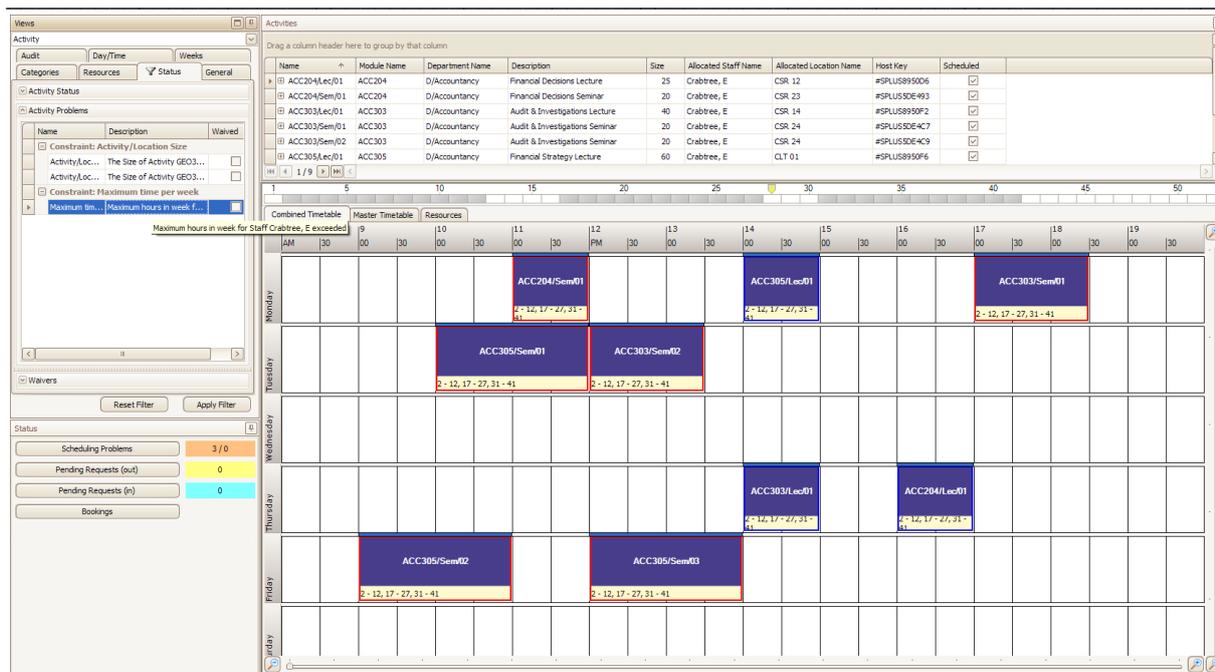


Figure 102 Timetable showing activities associated with a problem

Work can now be undertaken by the user to solve the displayed problem.

It should be noted that problems are sometimes associated with a particular activity; for example, an activity with a *Real Size* that is greater than the capacity of the room into which it is scheduled. In this instance a **Scheduling Problem** will occur. In such a case, there will only be a single activity associated with the problem.

Alternatively, a problem may be associated with some other object. In the example illustrated above, none of the activities, by themselves, have a problem. The combination of several activities allocated to the same member of staff is the cause of the problem, so the problem “belongs” to the member of staff, not to the activities. The activities are, however, involved with the problem. Applying the filter to the problem will find and display all the *Activities* involved.

As the user makes adjustments to the timetable, the *Activity Filter* is updated accordingly. It is therefore possible that as a result of an adjustment the activity is no longer involved with the problem. In the example illustrated above, resolving the *Maximum time per week Constraint* violation by allocating *one* activity from the staff member with the problem to another staff member would provide a solution. The remaining activities will then cease to be a contributing factor to the problem, and will disappear from view.

7.2 Waiving Scheduling Problems

To *Waive* a problem, the user can select *Waive Problem* from the *Actions* drop-down menu.

The user will be prompted to enter a reason for the *Waiver*. This should be text that explains why the **Scheduling Problem** can be overlooked.



Figure 103 Reason for waiver

To see existing *Waivers* the user can open the *Waivers* section of the *Status* tab of the **Activity Filter**. This is achieved by clicking on the  **Waivers** arrow at the bottom of the **Views Pane**.

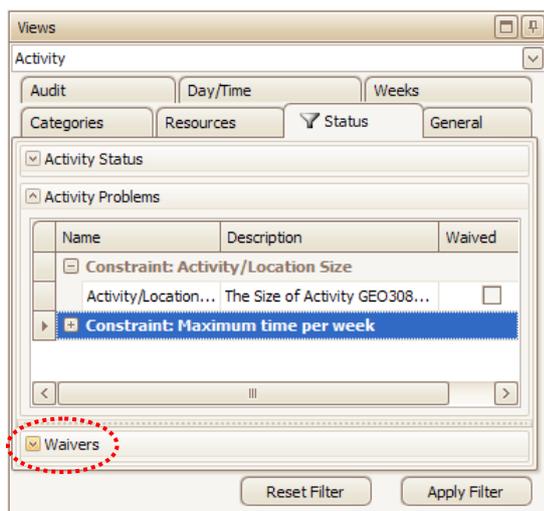


Figure 104 Waivers button

You will then see a list of all the *Waivers* that have been applied.

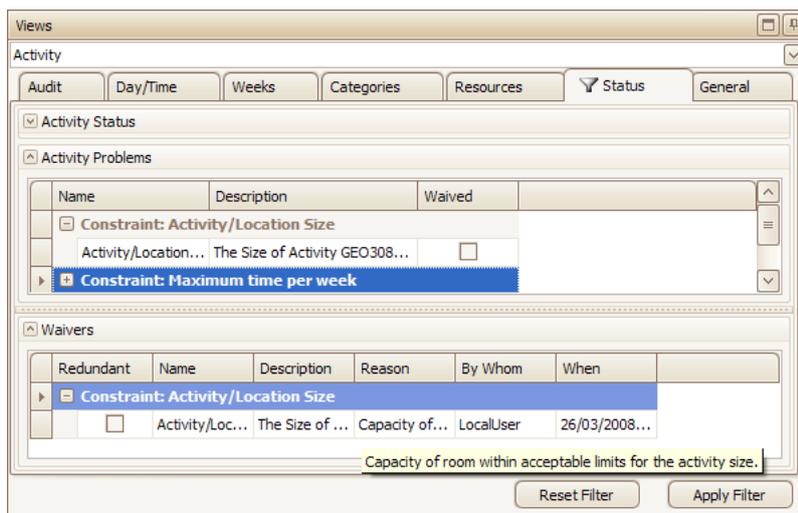


Figure 105 Waivers section open

Waivers are persistent objects. Having waived a **Scheduling Problem** it is possible for the scope of the problem to be extended without the need for an additional *Waiver*. For example, a staff member breaking a *Maximum Hours* constraint by 1 hour could be assigned additional activities in the same time block without the need for a new *Waiver* each time an activity is added. This is because the **Scheduling Problem**, (member of staff exceeds Maximum Hours in Time Block), has not changed. *The fact that the hours are now exceeded by a greater number does not constitute a new problem.*

On the other hand, if a new **Scheduling Problem** is created, even if it of the same type and applies to the same object, it will not be waived by an existing *Waiver*. For example, if an activity were added such that a staff member was now breaking the *Maximum Hours* constraint for a different Time Block, that would constitute a new problem.

7.3 Unwaiving or Deleting a Waived Scheduling Problems

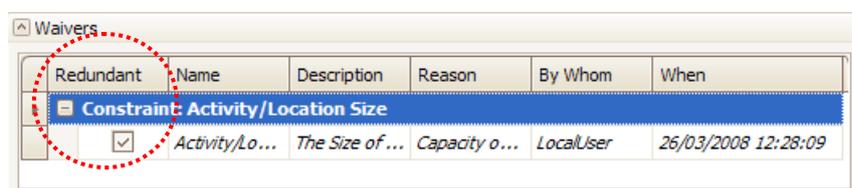
A **Scheduling Problem** that has been *Waived* can be *Unwaived* using the *Unwaive problem* option on the *Action* drop-down menu. This will delete the previously created *Waiver*. Selecting a *Waiver* and deleting it using the *Delete waiver* option from the *Action* drop-down menu will have a similar effect. The **Scheduling Problem** will be reinstated.

7.4 Waiver Redundancy

It is possible for a *Waiver* to become *redundant*. This state will occur if the **Scheduling Problem** that it was waiving is resolved.

For example, with the *Activity/Location Size Constraint* illustrated above, the problem could be solved by reducing the *Size* of the activity so that it is within the limits of the *Capacity* of the room.

This will resolve the **Scheduling Problem**, and on examination of the *Waivers* section of the *Status* tab it is noted that the *Waiver* still exists but has now become *redundant*.



| Redundant | Name | Description | Reason | By Whom | When |
|-------------------------------------|------------------------------------|-----------------|----------------|-----------|---------------------|
| <input checked="" type="checkbox"/> | Constraint: Activity/Location Size | | | | |
| <input type="checkbox"/> | Activity/Lo... | The Size of ... | Capacity o ... | LocalUser | 26/03/2008 12:28:09 |

Figure 106 Redundant waiver

If the user were to increase the *Size* of the activity again, (thereby exceeding the *Capacity* of the room), the existing *Waiver* would be re-applied to the problem; the *Waiver* would then cease to be *redundant*.

7.5 Deleting a Redundant Waiver

Over time, a number of redundant *Waivers* may accumulate. If the user determines that these *Waivers* are no longer required, or that users will create a fresh *Waiver* for any problem that has been resolved and then re-created, then the redundant *Waivers* can be deleted.

Select the redundant *Waiver* and use *Delete waiver* from the *Action* drop-down menu.

It should be noted that *deletion of a Waiver cannot be undone*.

8 Request, Grant & Deny

This functionality is only available when Enterprise Timetabler is in multi-user mode. Each user may be given either “Full” or “Request” permission against specific resources. **Authorisation Manager** is used to assign these permissions.

Authorisation Manager works along similar lines to the Scientia Database Administration (SDAdmin) software, where user rights are defined allowing users to carry out some actions but not others. In Enterprise Timetabler, this functionality is more complex with an additional level of permission being introduced, namely that of “Request”. A user who has **Request** permission on some resources, (the same user may have **Full** permission on others), may generate requests to use those resources. Requests can then be *granted* (or *denied*) by another user with **Full** permission on the resources.

8.1 “Full” & “Request” Permissions

The difference between **Full** permission and **Request** permission is explained fully in Section 1.2 of this User Guide.

Two scenarios can be examined in relation to the setting of permissions. A user may have **Full** permission or **Request** permission against a resource. In addition, a user may also have a *combination* of both permissions on the allocated resources, for example, **Full** permission to use the allocated Staff, but only **Request** permission for the desired Location.

- Where a user has **Full** permission on all the resources allocated to an activity, the Timetable grid in Enterprise Timetabler will show blue diamonds where that activity can be rescheduled.

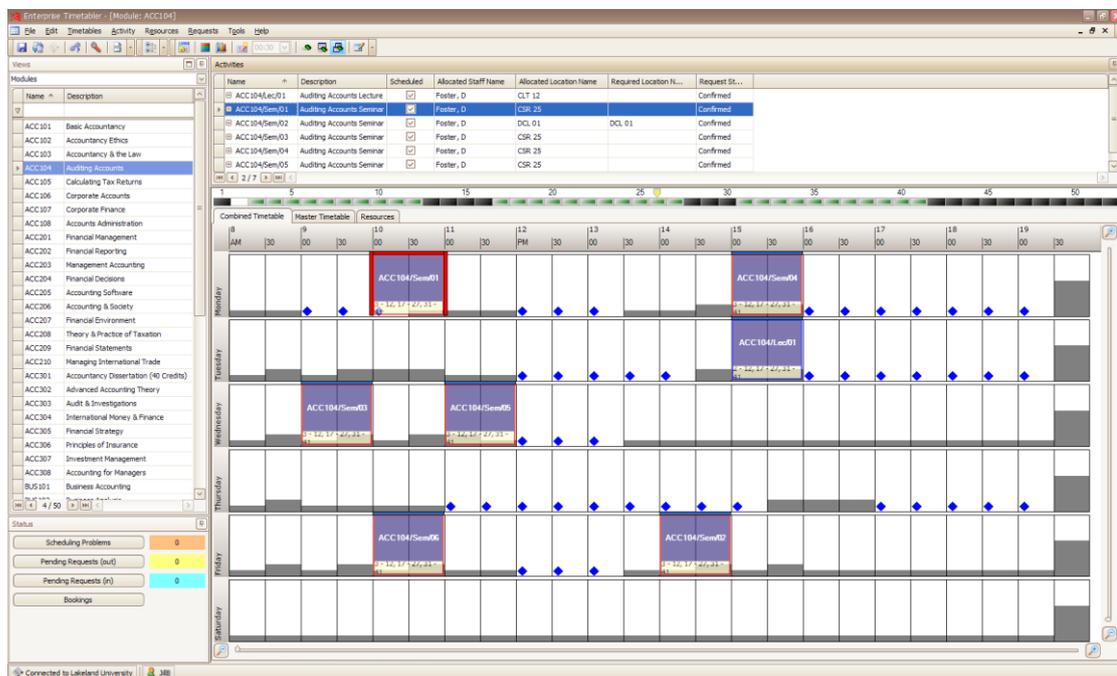


Figure 107 Full permission to allocate

In the example shown above, the *Accounting* departmental user has **Full** permission for both the Staff and Location resources suitable/available for the activity. In this case therefore the user is able to reschedule the activity at any of the points on the timetable where a blue diamond occurs.

- Where the user has **Request** permission only, on one or more of the resources suitable/ available for an activity, the Timetable grid in Enterprise Timetabler will appear to be greyed out and rescheduling is not possible because the user does not have permission to use all the resources.

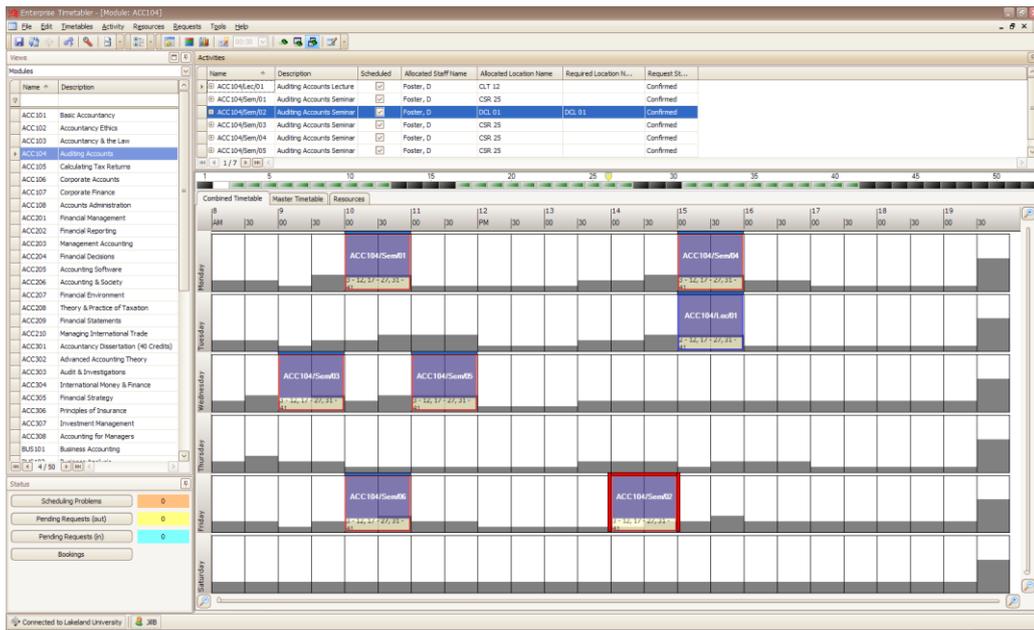


Figure 108 No permission to allocate location

In the example shown above, the *Accounting* departmental user has **Full** permission in respect of the allocated Staff member (Foster, D), but only **Request** permission against the Location (DCL01, which “belongs” to the Computing Department). In this case, the grid is “greyed out” and the user is unable to reschedule the activity.

8.2 Entering Request Mode

The user can change the Timetable grid by clicking on the  icon to enable *Request Mode*. In this instance, the Timetable grid will change to display amber triangles where the activity can be rescheduled, *but with a Request generated for the use of the Location resource*.

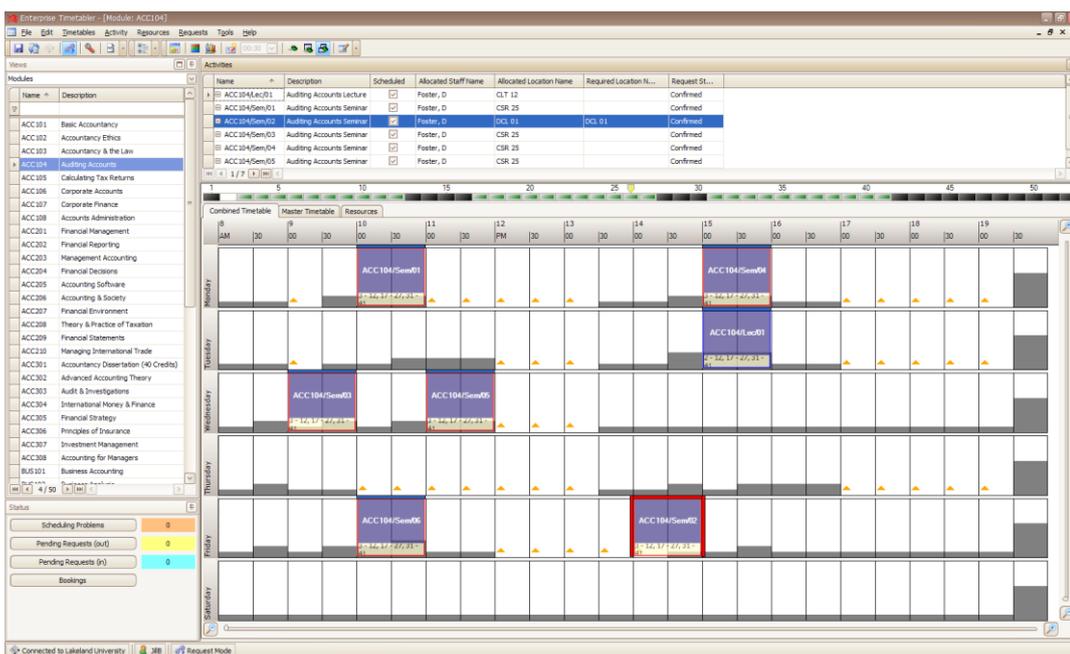


Figure 109 Request mode

If the activity is rescheduled and the *Request status* column has been included in the **Activity** spreadsheet then the entry in that column will indicate that although the activity is scheduled there is a pending request for one or more resources.

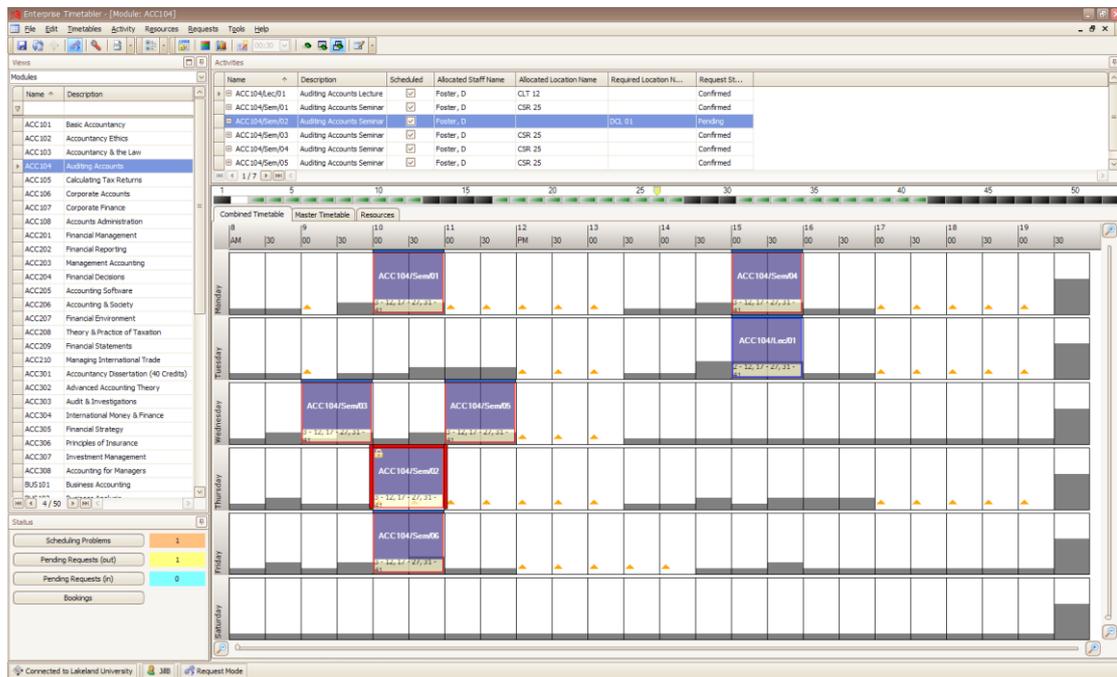


Figure 110 Pending request in timetable

In the case illustrated, the *Request Status* is shown as “Pending”, and the *Allocated Location Name* is blank. However, the *Required Location Name* contains the **Requested** Location which is pending confirmation by a user with **Full** permission for the Location resource.

| Activities | | | | | | | |
|---------------|---------------------------|-------------------------------------|----------------------|-------------------------|------------------------|---------------|--|
| Name | Description | Scheduled | Allocated Staff Name | Allocated Location Name | Required Location N... | Request St... | |
| ACC104/Lec/01 | Auditing Accounts Lecture | <input checked="" type="checkbox"/> | Foster, D | CLT 12 | | Confirmed | |
| ACC104/Sem/01 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/02 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | DCL 01 | Pending | |
| ACC104/Sem/03 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/04 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/05 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |

Figure 111 Pending request in activity list

In the Status Palette, there is a Scheduling Problem, and a Pending Request (out). The scheduling problem is a *Deferred Resourcing* problem pending the allocation of the requested room. In this instance, the Activity has rescheduled, but the allocation of the Location resource has been deferred, pending confirmation by a user with **Full** permission against the resource.

8.3 Making a Request

Essentially, a **Request** is generated when a user schedules or reschedules an activity using resources which they do not have **Full** permission to use. Any user with allocate permission against a resource can grant or deny a **Request**. This is done via the Enterprise Timetabler Interface.

In the example shown below, the user needs to reschedule the activity from a room where they have **Full** permission into a different room where they only have **Request** permission. It is therefore necessary to generate a **Request**.

Note that having selected the activity to be rescheduled, initially there are blue diamonds showing on the screen. In **Request Mode**, and using the **Resources Editor**, the user can untick the Keep Box, remove the current suitability, and add the suitability of the required new location. The Change Requirement button should then be selected. A search can then be undertaken to determine which of the locations are available at the required time, (using the Search button) and an available room can be selected. Clicking on the Schedule button will generate a request which can be clearly seen in the *Current* column.

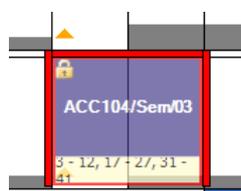
| Requirements | Current | Available | | | | | | | | | | |
|------------------|--|--|------|--------|--------|---|--------|---|--------|---|--------|---|
| Day | Wednesday <input checked="" type="checkbox"/> Keep | | | | | | | | | | | |
| Time | 09:00 <input checked="" type="checkbox"/> Keep | | | | | | | | | | | |
| Location | DCL 01 (Requested) <input type="checkbox"/> Keep | <table border="1"> <thead> <tr> <th>Name</th> <th>Per...</th> </tr> </thead> <tbody> <tr><td>DCL 01</td><td>R</td></tr> <tr><td>DCL 02</td><td>R</td></tr> <tr><td>DCL 12</td><td>R</td></tr> <tr><td>DCL 13</td><td>R</td></tr> </tbody> </table> | Name | Per... | DCL 01 | R | DCL 02 | R | DCL 12 | R | DCL 13 | R |
| Name | Per... | | | | | | | | | | | |
| DCL 01 | R | | | | | | | | | | | |
| DCL 02 | R | | | | | | | | | | | |
| DCL 12 | R | | | | | | | | | | | |
| DCL 13 | R | | | | | | | | | | | |
| Staff | Foster, D <input checked="" type="checkbox"/> Keep | | | | | | | | | | | |
| Equipment | | <input checked="" type="checkbox"/> Keep | | | | | | | | | | |

Figure 112 Pending request in resource tab

Once the activity has been adjusted, both the **Timetable** grid and the **Activities Spreadsheet** change to reflect the rescheduled activity. The activity is shown as pending in the *Request Status* column, but does not have a room listed in the *Allocated Location* column.

| Name | Description | Scheduled | Allocated Staff Name | Allocated Location Name | Required Location N... | Request St... |
|---------------|---------------------------|-------------------------------------|----------------------|-------------------------|------------------------|---------------|
| ACC104/Lec/01 | Auditing Accounts Lecture | <input checked="" type="checkbox"/> | Foster, D | CLT 12 | | Confirmed |
| ACC104/Sem/01 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed |
| ACC104/Sem/02 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | | DCL 01 | Pending |
| ACC104/Sem/03 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | | DCL 01 | Pending |
| ACC104/Sem/04 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed |
| ACC104/Sem/05 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed |

Figure 113 Pending request in activity list



Furthermore, on the **Timetable** grid, the activity has a padlock symbol appended.

Effectively, the activity is now “locked” pending the outcome of the request that has been submitted by the user. The only action now available to the requester is to cancel the request (Request | Cancel). Cancelling will remove the requested resource and unlock the activity.

Figure 114 Pending request in timetable



In order to make any change to a pending request the user must first cancel the request. On cancellation the activity is returned to its original state (before the request was made) and can be edited in the normal way, including making a different request.

Selecting Pending Requests (out) in the Status palette will automatically filter to show activities which have requests pending against them. Requests (out) = “requests I have made that are awaiting a response.”

Selecting Pending Requests (in) will filter to show activities that have a pending request for resources that the user can allocate = “requests that have been made by other people that are awaiting my attention”.

8.4 Granting a Request

Any user with allocate permission against a resource can grant or deny a request.

Once a request has been made, the onus passes to the users who are able to grant or deny requests – in other words the users who have full permission against the resources that have been requested.

On opening Enterprise Timetabler, the user is able to select “Pending Requests (in)” from the Status palette. This will filter the activities to show those with requests pending against them.

When an individual activity in the pending state is selected, the user can select “Grant Request” from the **Requests** drop-down menu. Using this function will automatically allocate a resource that satisfies the requirements of the activity. If the user did not select a specific resource (preset) then the scheduling engine will make a wildcard allocation. The function is not available when more than one activity is selected.

To exercise greater control over the allocation of resource in response to a request, the user may use the Resource tab to allocate resources, manually selecting a resource that will satisfy the requirement.

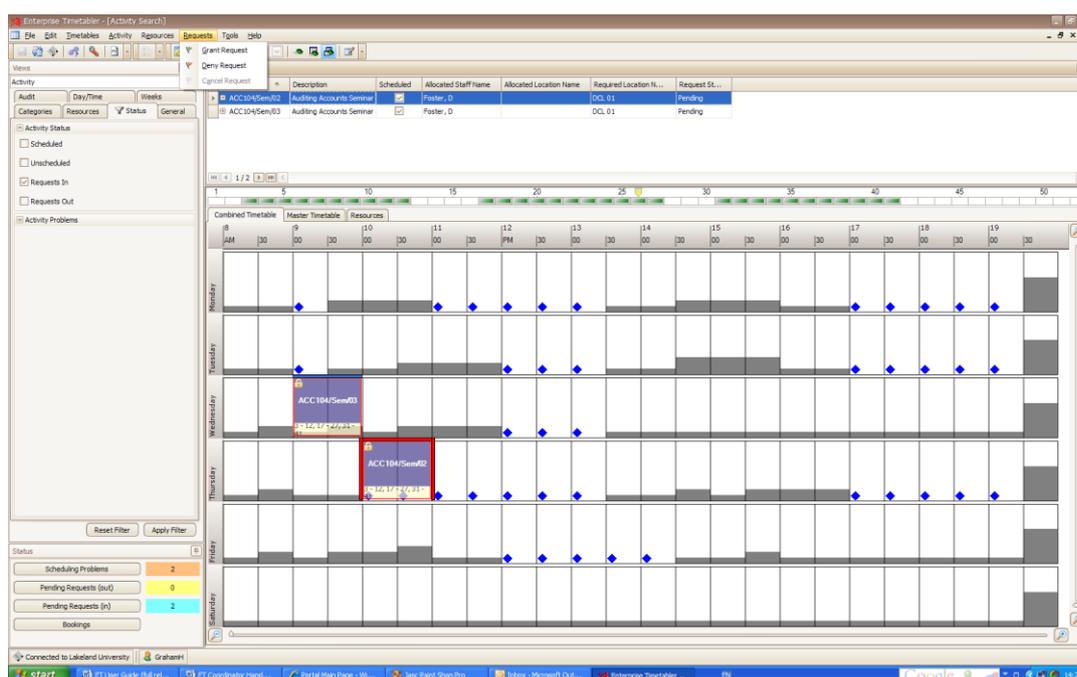


Figure 115 Granting a request

Granting the request will open a window confirming the action. Clicking OK will complete the process. The Activity will then disappear from the list of filtered activities “Pending Requests (in).”

In the Activity Spreadsheet, the Activity will now appear differently. The Request Status column will change to “Confirmed”, and the Allocated Location column will show the required room.

| Activities | | | | | | | |
|---------------|---------------------------|-------------------------------------|----------------------|-------------------------|------------------------|---------------|--|
| Name | Description | Scheduled | Allocated Staff Name | Allocated Location Name | Required Location N... | Request St... | |
| ACC104/Lec/01 | Auditing Accounts Lecture | <input checked="" type="checkbox"/> | Foster, D | CLT 12 | | Confirmed | |
| ACC104/Sem/01 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/02 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | DCL 01 | DCL 01 | Confirmed | |
| ACC104/Sem/03 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | | DCL 01 | Pending | |
| ACC104/Sem/04 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/05 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |

Figure 116 Granted request

Granting the **Request** will also resolve the “*Deferred Resourcing*” problem.

8.5 Denying a Request

Request Deny Text

Room being refurbished

The user also has the capability to deny a request. Selecting “Deny Request” from the **Requests** drop-down menu will open a small window inviting the user to give a reason for denying the request.

Clicking the OK button will open a second small window confirming the denying of the request.

Figure 117 Denying a request

In the Activity Spreadsheet, the Request Status column will change to “Denied”, the Request Deny Text column will be populated with the entered text, and the Allocated Location column will remain blank.

| Activities | | | | | | | |
|---------------|---------------------------|-------------------------------------|----------------------|-------------------------|------------------------|---------------|------------------------|
| Name | Description | Scheduled | Allocated Staff Name | Allocated Location Name | Required Location N... | Request St... | Request Deny Text |
| ACC104/Lec/01 | Auditing Accounts Lecture | <input checked="" type="checkbox"/> | Foster, D | CLT 12 | | Confirmed | |
| ACC104/Sem/01 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/02 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | DCL 01 | DCL 01 | Confirmed | |
| ACC104/Sem/03 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | | DCL 01 | Denied | Room being refurbished |
| ACC104/Sem/04 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |
| ACC104/Sem/05 | Auditing Accounts Seminar | <input checked="" type="checkbox"/> | Foster, D | CSR 25 | | Confirmed | |

Figure 118 Denied request

In this case, the user who made the request would need to select a different room.

9 Configuration, Filtering & Searching

9.1 Personalisation of the Menu Bar & Toolbar

Selecting the down arrow at the right-hand end of each toolbar will open short menus which allow the user to personalize each toolbar:

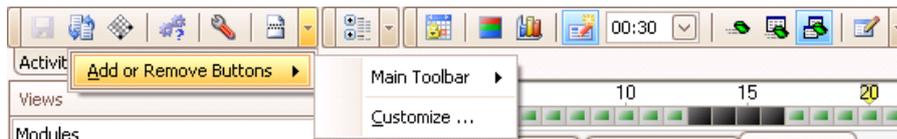


Figure 119 Tool bar

Using the *Main Toolbar* selection, icons can be added, or existing icons removed.

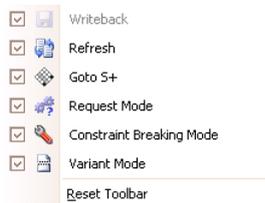


Figure 120 Icon selection

Using the *Customize* selection, the view presented can be changed to suit the needs of the user.

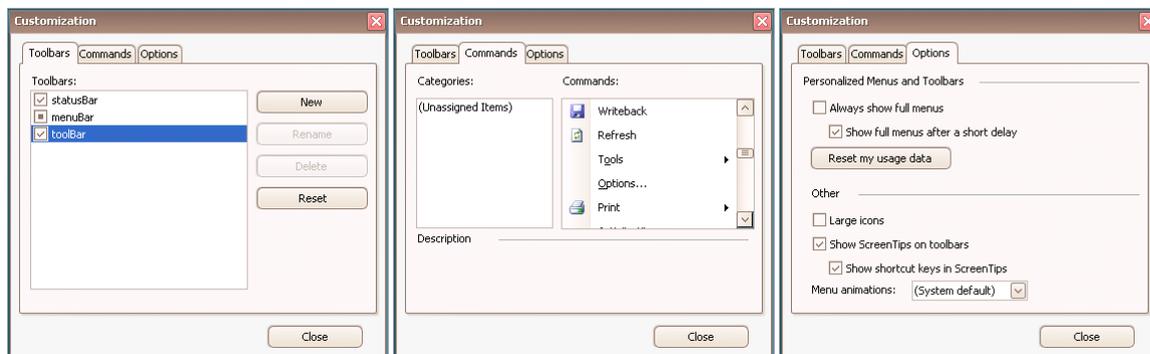


Figure 121 Custom selection of toolbar functions

9.2 Filtering Activities in the Views Pane



Comprehensive filtering of activities can be undertaken by selecting the *Activities* object in the **Views Pane**. The selection of *Activity* opens up a different style of pane.

The pane consists of a series of tabs that can be opened individually.

Each tab allows the user to filter activities by a series of different criteria.

Each tab may contain a combination of criteria, and each criterion may have a number of options.

Figure 122 Activity pane

Individual or combinations of filters can be chosen depending on the outcome required by the user. It is important to note that when fields are unset they have no influence on the filter, i.e. all activities will be included in the filtered set. If multiple fields are set then the filter results are obtained by a logical AND of all the criteria, i.e. an activity must match all of the set fields to be included in the filtered set.

Each of the tabs is illustrated and described below.

9.2.1 Audit Tab

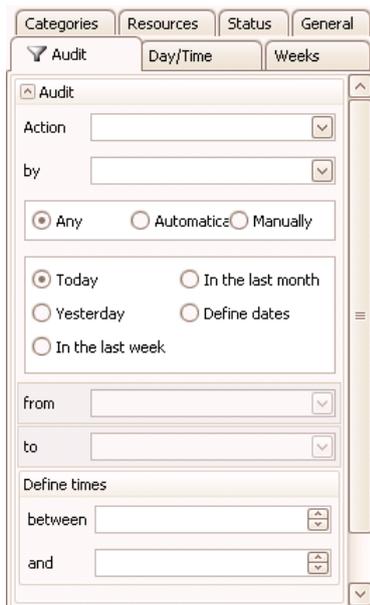


Figure 123 Audit tab

The *Audit* tab allows the user to filter activities by the time (according to the PC clock) when the action of scheduling was carried out.

In addition the user can filter on the user name of the person who scheduled the activity and, using radio buttons, whether that scheduling was done automatically or manually.

The time can be specified using one of a set of short cuts to find activities scheduled *Today*, *Yesterday*, *In the last week* or *In the last month*. More specific times can be defined by using the *Define dates* option. This allows the user to specify a range of dates for the search

It is also possible to filter on the basis of the time in the day when scheduling took place. A range of times can be specified.

9.2.2 Day/Time Tab

The screenshot shows the 'Day/Time' tab with the following sections:

- Suggested Days:** Radio buttons for 'Any of', 'All of', and 'None'. Checkboxes for Mon, Tue, Wed, Thu, Fri, Sat, Sun.
- Suggested Time:** Radio buttons for 'Exactly', 'Between', and 'None'. Input fields for time and 'and'.
- Scheduled Day:** Radio buttons for 'Any of', 'All of', and 'None'. Checkboxes for Mon, Tue, Wed, Thu, Fri, Sat, Sun.
- Scheduled Time:** Radio buttons for 'Exactly', 'Between', and 'None'. Input fields for time and 'and'.

Figure 124 Day/ Time tab

9.2.3 Week Tab

The screenshot shows the 'Weeks' tab with the following sections:

- Teaching weeks:** Radio buttons for 'Exactly matching week pattern', 'Contained within week pattern', and 'Overlapping with week pattern'.
- Matching criteria:** Radio buttons for 'by name', 'by number', and 'by date'. Input fields for name, number, and date range (from, to).
- Number of weeks between:** Input fields for 'Number of weeks between'.

Figure 125 Weeks tab

Under the *Day/Time* tab, activities can be filtered by *Suggested Days*, *Suggested Times*, *Scheduled Days* and *Scheduled Times*.

For *Suggested Days* and *Scheduled Days*, multiple-selection of days is allowed. If more than one day is selected then the *Any of* and *All of* options allow different interpretations of the selection to find activities that match any of the selected days or all of the selected days (in other words, activities with in-week-repetition).

The *Suggested Times* and *Scheduled Times* can also be matched to an exact start time or a range (using the *Between* option).

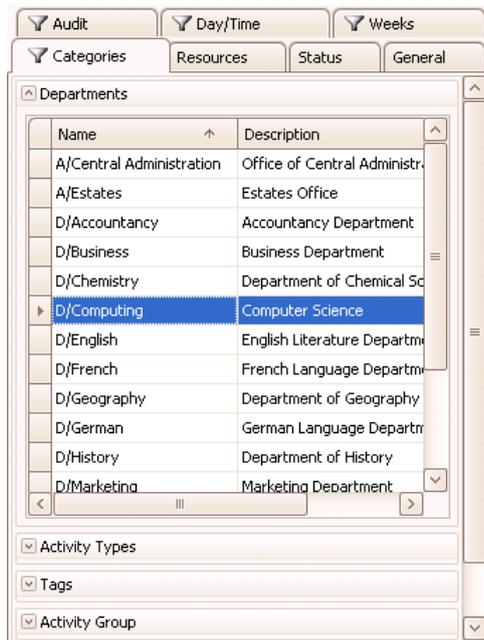
Using the *Week* tab, activities can be filtered by *Teaching Weeks*.

Activities can be filtered by week pattern in 3 ways to find activities that (a) exactly match the specified week pattern, (b) are contained within the specified week pattern, having no weeks outside of it, or (c) have some overlap with the pattern.

The pattern to be matched can be defined by name (using a named availability pattern), by week numbers (e.g. 1-5,8-9) or by dates (giving start and end dates).

Filtering by number of weeks, uses the number of weeks in which the activity is scheduled (e.g. 1-5, 8-9 is a 7 week activity) as a criterion for filtering.

9.2.4 Categories Tab



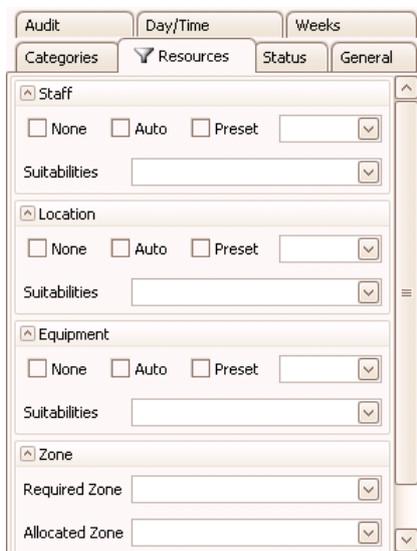
Filtering using the *Categories* tab enables activities to be divided up by *Department*, *Activity Type*, *Tags* and *Activity Groups*.

Remember that multiple selections in the same criterion are applied with a logical OR so that selecting multiple departments returns activities in any of the selected departments.

Selecting multiple criteria is applied with a logical AND so selecting an activity type as well as departments would return activities that are in any of the selected departments AND are of the selected type.

Figure 126 Categories tab

9.2.5 Resources Tab



The *Resources* tab allows activities to be filtered by their resource allocation and requirement. Separate sections allow filtering on *Staff*, *Location*, *Equipment* and *Zone*.

The filter criteria include the actual resource allocated, whether the allocation was automatic (wildcard) or as the result of a preset and the *Suitabilities* specified as a requirement.

The *None* option in each case allows a search for activities with no resource of a specified type.

Figure 127 Resources tab

9.2.6 Status Tab

The screenshot shows the 'Status' tab in the Enterprise Timetabler software. It features a tree view with two main sections: 'Activity Status' and 'Activity Problems'. Under 'Activity Status', there are four checkboxes: 'Scheduled', 'Unscheduled', 'Requests In', and 'Requests Out'. Under 'Activity Problems', there are three expandable sections: 'Constraint: Free Block', 'Constraint: Maximum Work Span', and 'Constraint: Resource Break'. Each section contains a list of specific constraints with their names and descriptions.

| Name | Description |
|--------------------------------------|-----------------------------|
| Research Day - Harris, R | Staff Harris, R must have |
| Research Day - Sa, J | Staff Sa, J must have 1 Tir |
| Tue_Wed O/T - Sa, J | Staff Sa, J must have 1 Tir |
| Constraint: Maximum Work Span | |
| FT Staff Max Span - Moore, P | Staff Moore, P cannot be a |
| FT Staff Max Span - Norman, P | Staff Norman, P cannot be a |
| FT Staff Max Span - Segal, B | Staff Segal, B cannot be a |
| FT Staff Max Span - Gorman, A | Staff Gorman, A cannot be a |
| Constraint: Resource Break | |
| Lunch Hour - Moore, P | Staff Moore, P requires 2 c |
| Lunch Hour - Norman, P | Staff Norman, P requires 2 |

Figure 128 Status tab

9.2.7 General Tab

The screenshot shows the 'General' tab in the Enterprise Timetabler software. It features a 'Views' window with a 'General' filter tab. The 'General' tab contains several sections: 'Identifiers' with dropdown menus for Name, Description, and Host Key; 'Size' with radio buttons for 'Planned size', 'Real size', and 'Size', and a 'between' range selector; 'Duration' with 'from' and 'to' time range selectors; 'Misc' with an 'Activity factor' range selector and a 'Section Id' dropdown; and 'User text' with four text input fields. At the bottom, there are buttons for 'Reset Tab', 'Reset Filter', and 'Apply Filter'.

Figure 129 General tab

The filter or combination of filters is applied using the  button.

The *Status* tab enables the user to filter activities by their status. They can be *Scheduled* and *Unscheduled* activities and activities against which there are *Requests* (both requests coming in and requests going out).

Activities can also be filtered by their *Problems*, (sub-divided into different Problem types). The Problem types can be expanded or contracted and selected as required.

Finally, there is a *General* filter tab which enables the user to filter by various *Identifiers* (Name, Description, Host Key). The type of match being looked for is selected from a dropdown list (e.g. starts with, contains etc).

When filtering by size the comparison can be against the *Planned size* (a figure entered by the user), *Real size* (a figure calculated by summing the sizes of the student sets allocated to the activity) or *Size* (whichever of these two figures is currently selected to be representative of the size of the activity).

The filter can be cleared using the  button.

On completion of the filter, the **Activities** spreadsheet and the **Timetable** tab will be populated with the activities required by the applied filter.



Where information is selected in a field which starts off “empty”, for example the ‘Action’ or ‘by’ fields in the Audit tab, any selection can be cleared (deselected) and the field set back to “empty” by using Ctrl Del or Ctrl 0. This applies to all the “empty” fields on all the tabs.

10 Booking mode

While it is possible to create an activity directly for a location, a member of staff or an item of equipment, by selecting the appropriate resource view, there are times when the user may wish to book a resource but does not know which one. In such a case the user will wish to assess the availability of resources before deciding on the appropriate one and making the booking.

To perform this function the user can use booking mode in ET. Booking mode is invoked by clicking on the  button on the toolbar. The effect of this will depend on the view the user currently has when the booking mode is invoked.

If the user is currently viewing one of the resources that can be booked (locations, staff or equipment) then a new window will be opened to book that type of resource. If the user is not currently viewing one of these resources then a booking window will be opened for the type of resource that was last booked by the user.

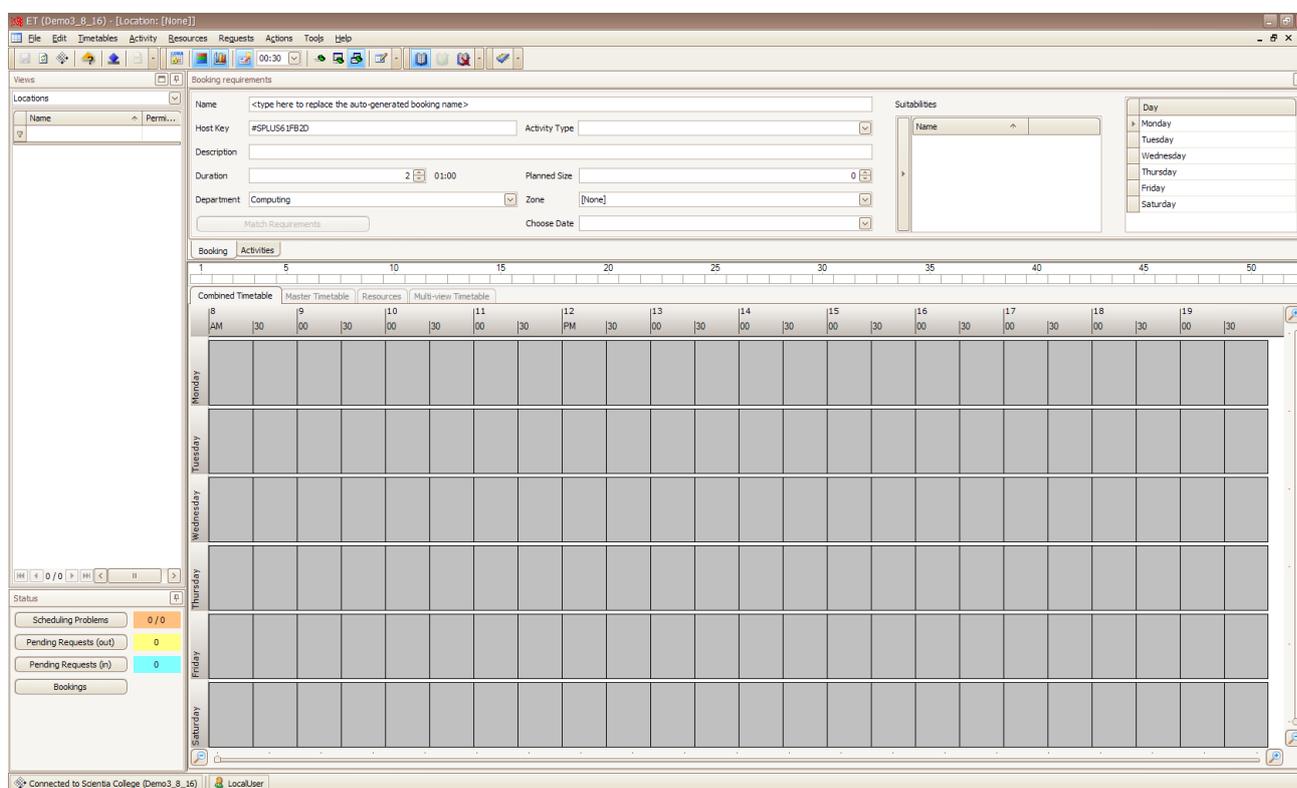


Figure 130 Booking mode

In booking mode, ET has 3 major panes, as in normal mode but their behaviour is slightly modified. The top right pane allows the user to specify the requirements for the resource to be booked. The bottom right pane, the timetable grid, is used to define the time when the resource is required and the left hand pane shows the available resources and allows the user to select the desired resource to book.

In order to create a booking the user must consider (a) when do I need the resource, (b) are there specific requirements and (c) which resource will I pick?

10.1 When do I need the resource?

The user may specify when the resource is required in a number of ways. If the user is familiar with the week numbering system, they may select a week or weeks using the normal selection methods described in section 2.9. If the user wishes to make a booking on multiple days, those can be selected from the list of days in the top right hand corner of the screen.

Alternatively, the user may prefer to select a date. This can be done by selecting the “Choose Date” control in the Booking Requirements pane. The user will then be presented with a calendar control that allows selection of any date within the bounds of the current timetable year.

Before assessing availability at a particular time, the user should consider other requirements that may narrow the choice of resource.

10.2 Are there specific requirements?

In the Booking Requirements pane the user can specify the following, each of which will affect the choice of resources offered:

Figure 131 Booking requirements

10.2.1 Duration

The duration of the activity will be considered when assessing the availability of resources. As when working in normal timetabling mode, blue diamonds are shown where an activity of the specified duration can start. The user does not need to find sufficient consecutive blue diamonds to accommodate the duration since the duration has already been considered; a single blue diamond is sufficient.

10.2.2 Planned size

Only locations that have a capacity large enough to accommodate the planned size of the activity will be offered.

10.2.3 Department

The booking activity will be deemed to belong to the selected department. Only locations that belong to that department or have been shared with that department will be offered.

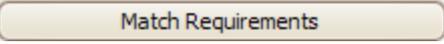
10.2.4 Zone

The activity will be deemed to take place in the selected zone and only locations that are in that zone or one of its descendants in the zone hierarchy will be offered.

10.2.5 Suitabilities

The user may select suitabilities (properties of the resource required for this booking) from a list of suitabilities using the suitabilities control. This works in the same way as described in section 4.1.1 where the same control appears as part of the resource tab.

10.3 Which resource?

The user can see a list of the resources that match the requirement as specified so far at any time by clicking the  button. This becomes live as soon as the user has made any change to requirements.

The timetable grid will display a blue diamond at any time where the resource requirements could be matched by an available resource. In order to see which resources are available at a particular time, the user can right click on any blue diamond and select “Match Requirements”. A proposed activity is then created at the selected time and of the required duration. The list of resources in the pane on the left will be updated to show only those that are available at the selected time as well as matching the specified requirements.

Once the proposed activity has been created, the user can move it to other times (using click and drag) to test availability of resources at those times. Each move will update the list of available resources.

Once the user has decided on the time for the booking, the resource can be selected. The timetable grid will now update to show other activities that are allocated to the selected resource within the week(s) of the booking.

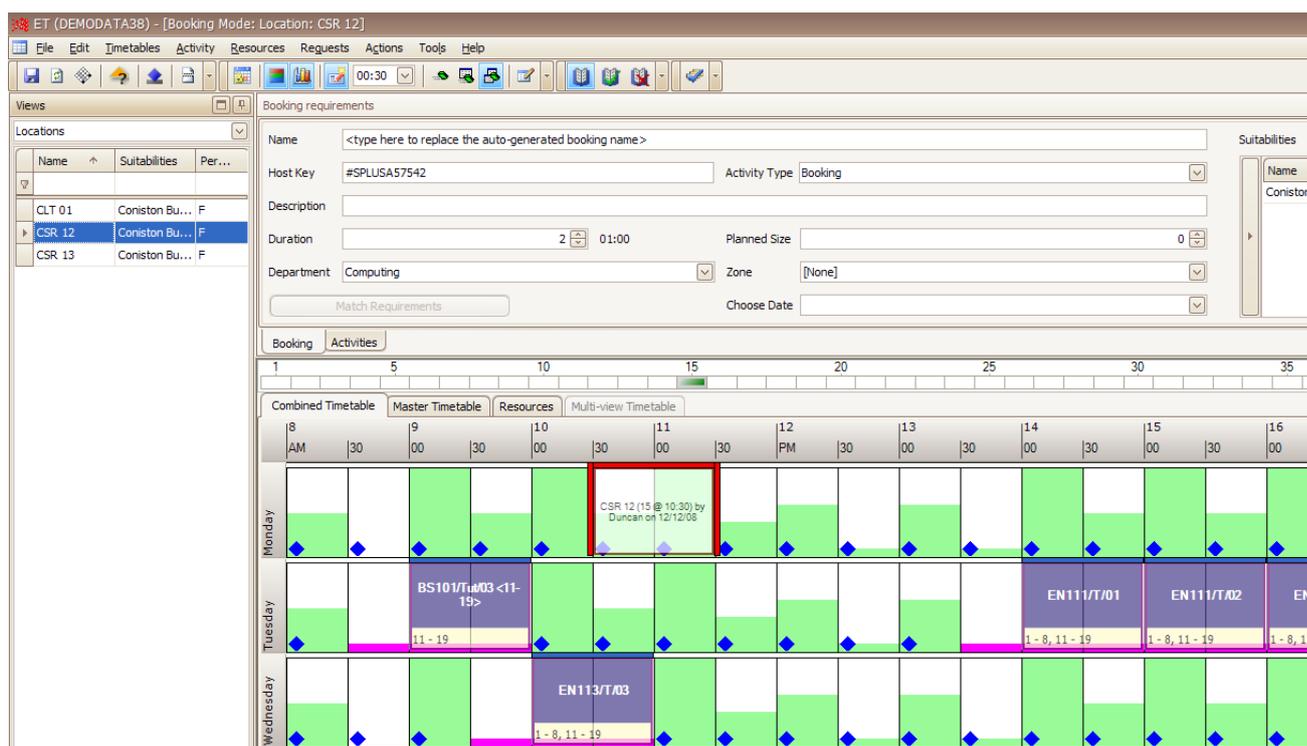


Figure 132 Booking proposed

The name that will be given (auto-generated) to the booking is configured at the institution level and is usually made up of elements of the booking such as the name of the resource being booked, the day / time of the booking, the user name of the booker etc. The proposed name will be displayed in the cell. If the user wishes to name the booking themselves they can do so by typing the desired name in the booking requirements pane. The Activity Type will default to “Booking” but the user may also change this if desired.

Once the user is happy with all the details of the proposed booking, the booking is confirmed by clicking the  button on the toolbar. The booking is then made permanent. The user may then leave booking mode or continue to make additional bookings.

10.4 Interaction with permissions

A user of ET must be given permission using Authorisation Manager to use ET in normal mode. A user that is lacking this permission (but does have permission to run ET) will be restricted to working in booking mode. It may be desirable in some circumstances to have users that are authorised only to make bookings.

Booking mode also interacts with the allocate and request permissions assigned by Authorisation Manager. A user with request (rather than allocate) permission to a resource will have to invoke request mode (see section 8.2) in order to see the availability of that resource. When the user makes a booking in this mode, the result will be a request that must be granted by another user with permission to allocate the requested resource.

11 Personalisation

There are general personalisation techniques that can be applied to the overall look of Enterprise Timetabler.

11.1 Pinning and Unpinning Elements

The **Views Pane**, **Activities** viewer and **Status** palette can be unpinned and hidden either collectively or individually. Using this technique allows more space for the **Timetable** grid, or allows the user to hide elements that are not being used at the time.

When any of the elements are unpinned, they become a named tab at the side, top or bottom of the screen depending on their starting position. Hovering over the tab with the cursor will re-open the required element. As soon as the cursor is taken off the required element, the element will close back to its unpinned position as a tab.

To unpin any of the elements, click on the  symbol to the top-right of the **Views**, **Activities**, or **Status** headings.

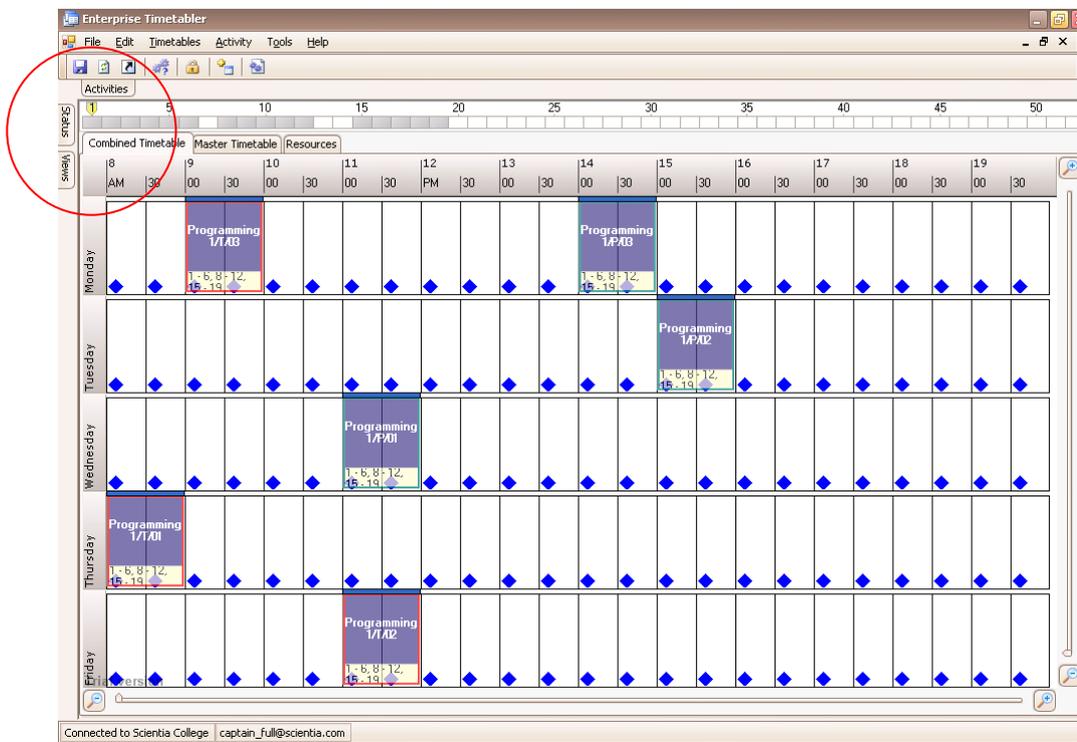


Figure 133 Panes unpinned

Hovering over a tab with the mouse will open the required element which will slide in from the side where it is unpinned.

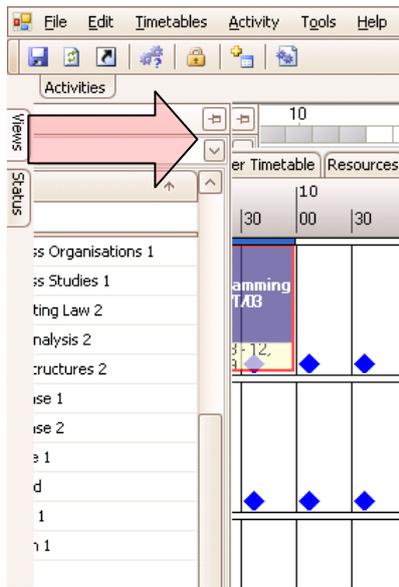


Figure 134 Accessing an unpinned pane

To pin the element into its visible position, hover over the required tab, and with the element open click on the  symbol. The element will then be restored.

11.2 Floating Elements

Elements that are docked by default can be made into floating panes by grabbing and moving them with the mouse. Floating windows can be resized using normal *Windows* techniques.

The illustration below shows the **Views Pane** and the **Activities** viewer floating, whilst the **Status** palette has been unpinned.

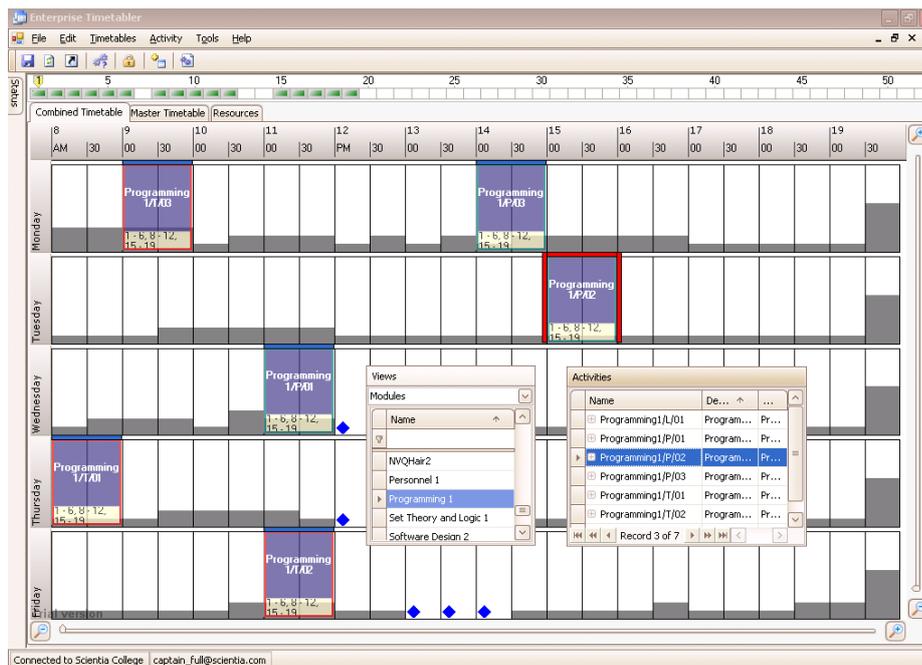


Figure 135 Floating elements

11.3 Repositioning Elements

The various elements can be repositioned anywhere on the screen depending on the requirements of the user.

Grabbing and moving one of the elements will cause the appearance of the positioning symbols shown in the illustration below.

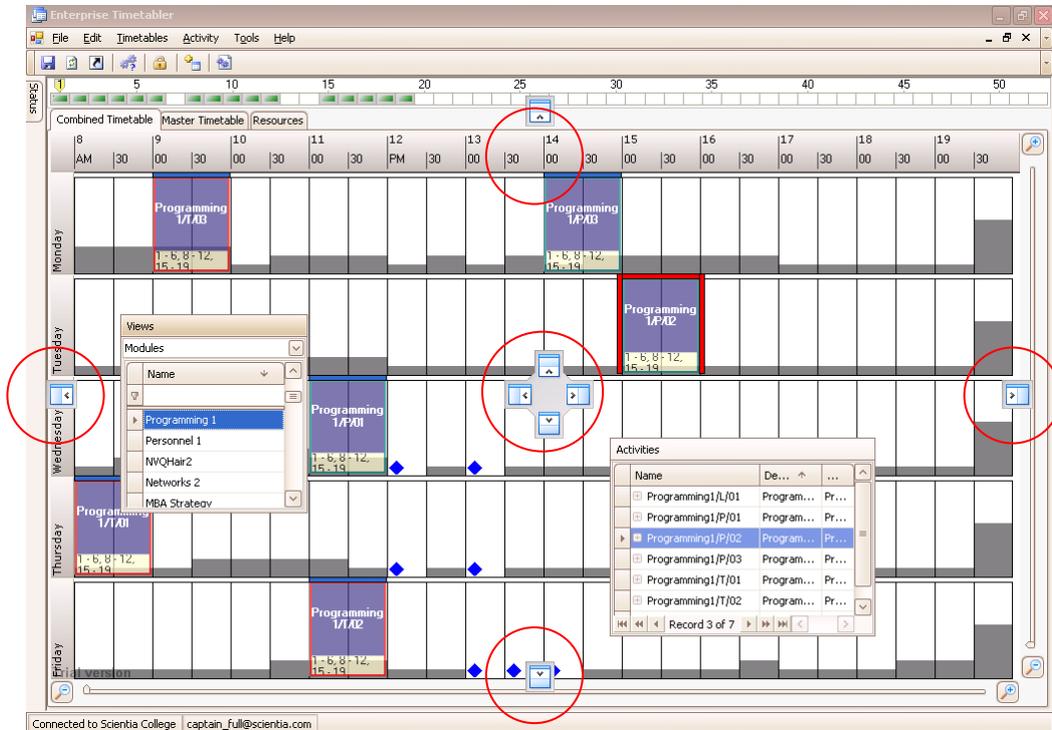


Figure 136 Positioning guides

Dragging the element to either of the symbols indicated in the illustration below will invoke the blue shaded area indicating the final position of the element. In the example below, the **Views Pane** is to be positioned on the left side of the screen.

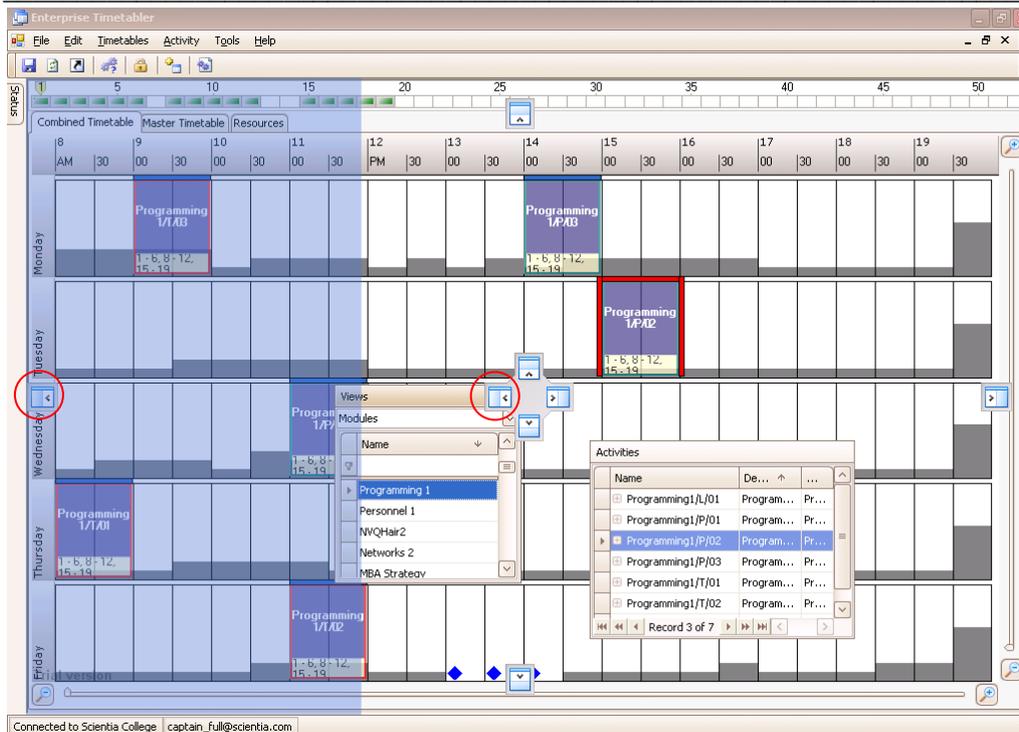
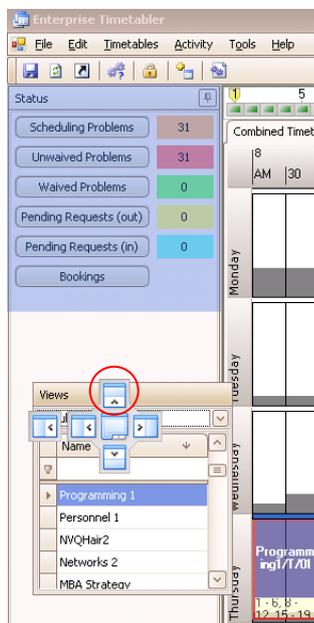


Figure 137 Positioning

Letting go of the mouse button will drop the **Views Pane** into the docked position.

It is also possible for elements to be positioned above each other in column. In this instance the location of the positioning symbols will change as illustrated below; the **Views Pane** is to be repositioned on the left-hand edge of the screen, and above the **Status** palette.



Giving the following outcome....

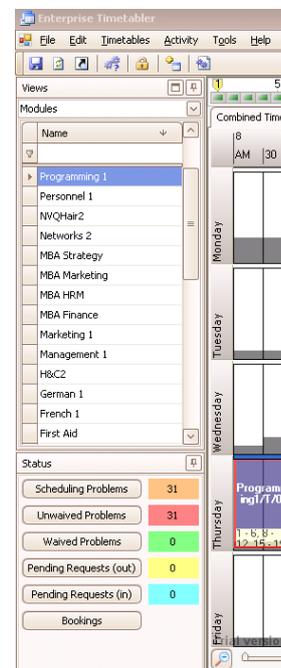
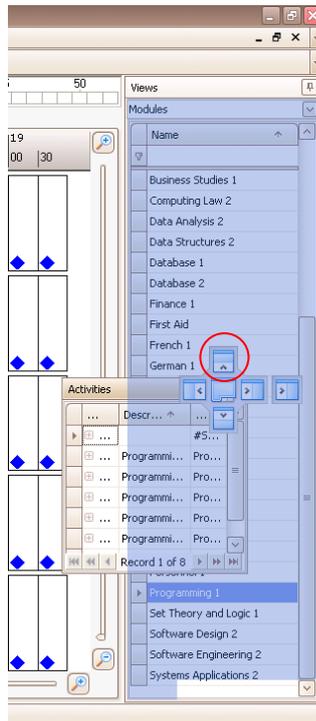


Figure 138 Repositioning the views pane

It is also possible to position elements on top of each other in a tabbed format. In this instance the central positioning symbol is used. The illustration below shows process for positioning the **Activities** viewer on top of the **Views Pane** as tabbed elements on the right-hand side of the screen. Note that the tabbed positioning symbol has been selected, and the blue shaded area also has a tab at the bottom left-hand corner.



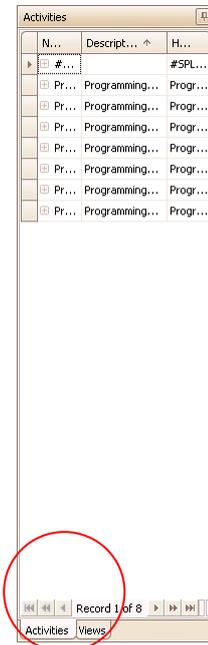
The following outcome results....

Note the **Activities** and **Views** tab at the bottom palette. Selecting either of these will place the palette on top.

The tabbed elements can be made into floating elements by grabbing either element by the and dragging and dropping in the middle of the

In addition, the tabbed elements can be pinned unpinned.

To remove an element from the tabbed format, it necessary to grab the required element *by the tab* than by the header. The element can then be and dropped in the middle of the screen.



of the required

tabbed header screen.

and

is rather dragged

Figure 139 Tabbed display

There are too many variations available to give examples of all the positioning possibilities, and it is therefore recommended that the user experiments with various combinations until their preferred layout is achieved. Default positions can be reset using *Tools | Reset | Layout*.

11.4 Viewing Multiple Timetables

Within Enterprise Timetabler, it is also possible to view multiple timetable grids in a variety of ways.

Selecting *Timetable* | *Add Timetable* will superimpose a new timetable grid *on top of* the existing timetable. A different object type can then be selected for the new timetable.

This process can be repeated until the required number of timetables has been created. Each new timetable is listed in the *Timetables* drop-down menu.



In this example, there are four timetables, one each for Module, Staff, Location and Student Set. The Module timetable is ticked, so is currently on view.

The user can select which timetable they wish to view from this menu.

Figure 140 Timetable menu

Alternatively, the user can change the view that appears in the **Timetable** grid by selecting one of the menu items at the top of the list.

Use Tabbed MDI places an additional set of tabs above the Week Pattern bar. The required timetable can then be selected using the appropriate tab. Each timetable can be closed by clicking on the at the top right-hand corner of the **Timetable** grid.

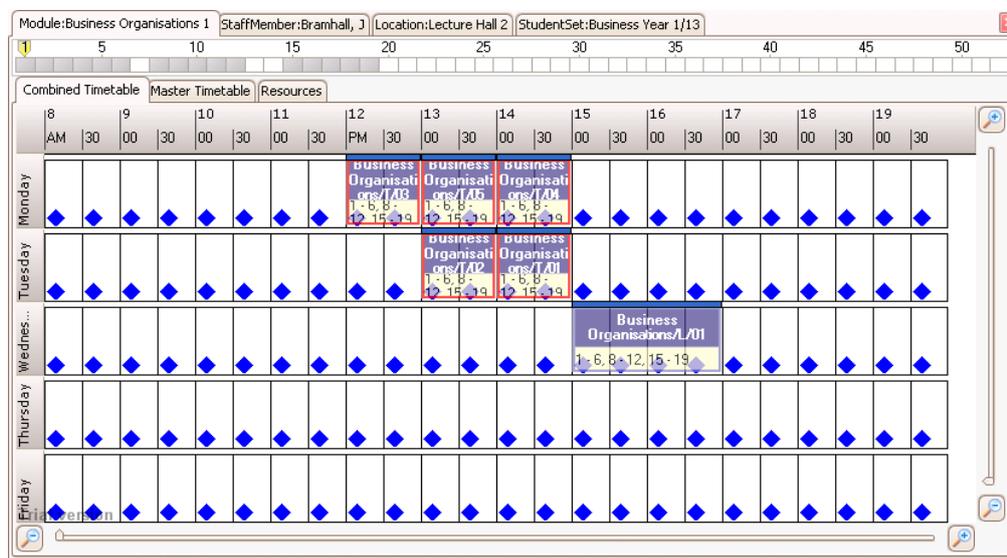


Figure 141 Multiple timetables in tabbed view

Cascade allows all the timetables to appear superimposed on top of one another within the grid space. For better viewing, each of the timetables can be maximised using the button. To minimise the timetable, the minimise button () at the right end of the **Toolbar** will need to be used. The symbol in the top right-hand corner of each timetable can be used to close the window.

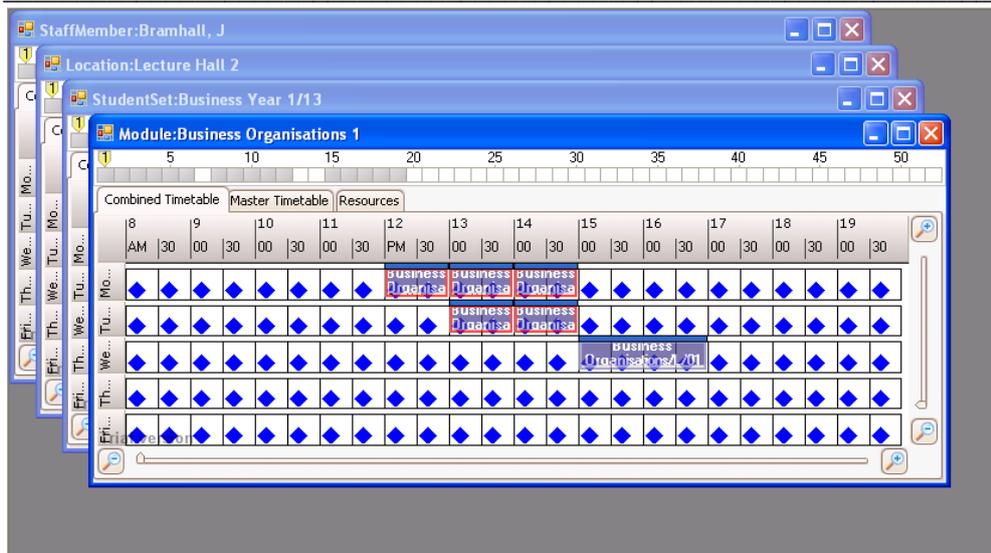


Figure 142 Multiple timetables in cascade view

With four timetables to be displayed, Tile Horizontally and Tile Vertically would appear the same. Using two timetables, the difference can be clearly seen.

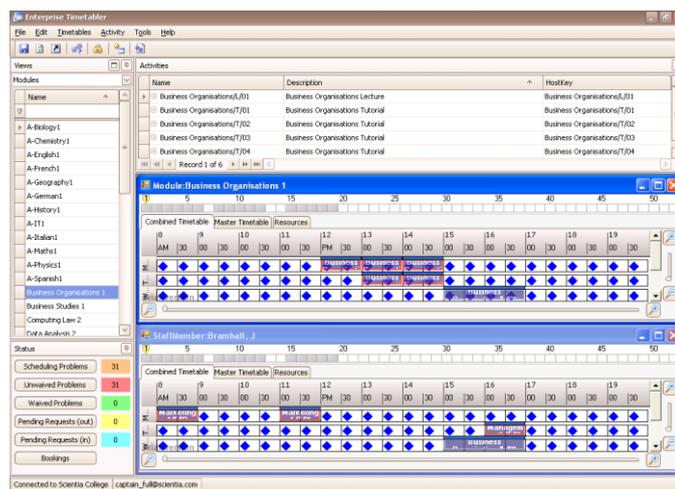


Figure 143 Multiple timetables tiled horizontally

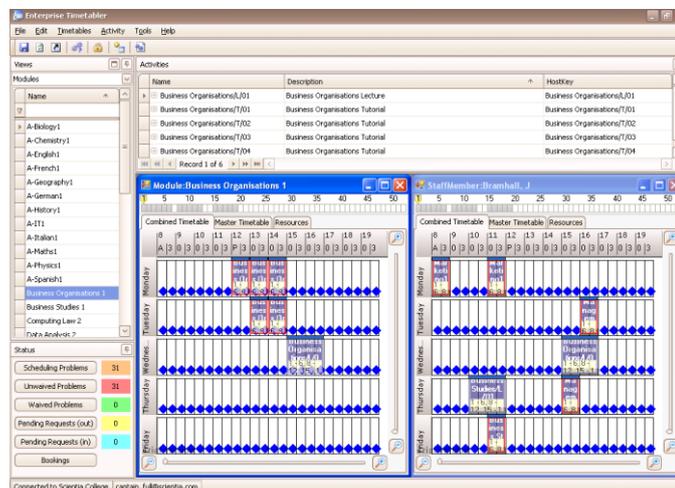


Figure 144 Multiple timetables tiled vertically

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12 Printing & Exporting Data

Enterprise Timetabler allows the user to either export or print data contained in the **Activities** spreadsheet and the **Views** pane. The **Timetable** grid can also be printed. This is not intended as a substitute for the printing system in Syllabus Plus and Report Designer but will give a quick hard copy of what is currently being viewed on screen. A simple selection procedure from the **File** drop-down menu is used to achieve these objectives.



Figure 145 Export and print menus

12.1 Exporting Data

Choosing *Export* from the **File** drop-down menu will open up a secondary menu allowing the user to choose either **Activities** or **View Items** depending on which data the user wishes to export.

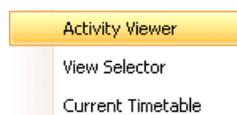
Selecting either of the menu choices opens up a window asking the user where the data is to be saved and in what format.

The data can be saved in Text format, html, pdf or Excel spreadsheet.

12.2 Printing Data

From the **File** drop-down menu, the user can select **Print**, and then choose which of the elements is to be printed (**Activities** spreadsheet, **Views** pane or **Timetable** grid).

12.3 Printing the Activity Spreadsheet



Choosing **Activity Viewer** will open a **Preview** window showing the **Activities** spreadsheet, and using the columns that are chosen in the viewer.

| Name | Description | Duration | Scheduled | Allocated Staff Name | Allocated Location Name |
|---------------|-----------------------|----------|-------------------------------------|----------------------|-------------------------|
| ACC104/Lec/01 | Auditing Accounts Lec | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CLT 12 |
| ACC104/Sem/01 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |
| ACC104/Sem/02 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |
| ACC104/Sem/03 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |
| ACC104/Sem/04 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |
| ACC104/Sem/05 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |
| ACC104/Sem/06 | Auditing Accounts Sen | 01:00 | <input checked="" type="checkbox"/> | Foster, D | CSR 25 |

Figure 146 Activity viewer print preview

The layout of the information shown in the preview can be configured using the drop-down menus or toolbar at the top of the **Preview** pane.

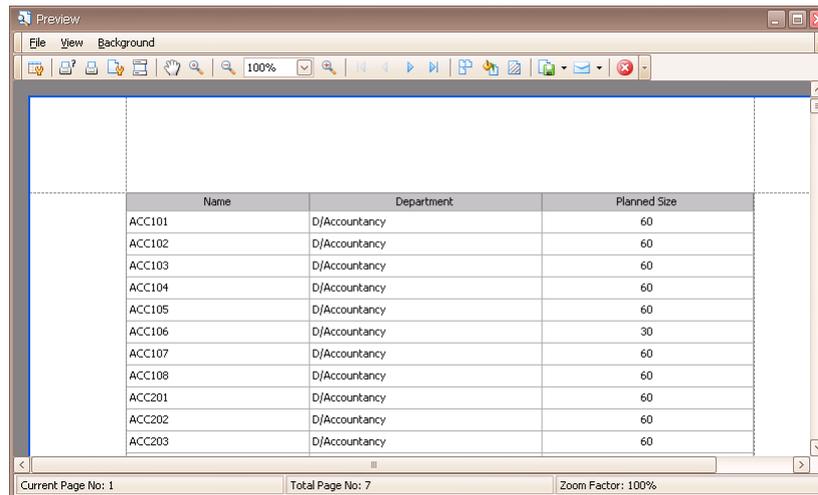
12.4 Printing the Views Pane

Activity Viewer

View Selector

Current Timetable

Choosing **View Selector** will also open a **Preview** window that works in a similar way to the window shown above.



The screenshot shows a 'Preview' window with a menu bar (File, View, Background) and a toolbar. The main content is a table with the following data:

| Name | Department | Planned Size |
|--------|---------------|--------------|
| ACC101 | D/Accountancy | 60 |
| ACC102 | D/Accountancy | 60 |
| ACC103 | D/Accountancy | 60 |
| ACC104 | D/Accountancy | 60 |
| ACC105 | D/Accountancy | 60 |
| ACC106 | D/Accountancy | 30 |
| ACC107 | D/Accountancy | 60 |
| ACC108 | D/Accountancy | 60 |
| ACC201 | D/Accountancy | 60 |
| ACC202 | D/Accountancy | 60 |
| ACC203 | D/Accountancy | 60 |

At the bottom of the window, it shows 'Current Page No: 1', 'Total Page No: 7', and 'Zoom Factor: 100%'.

Figure 147 Print preview of views pane

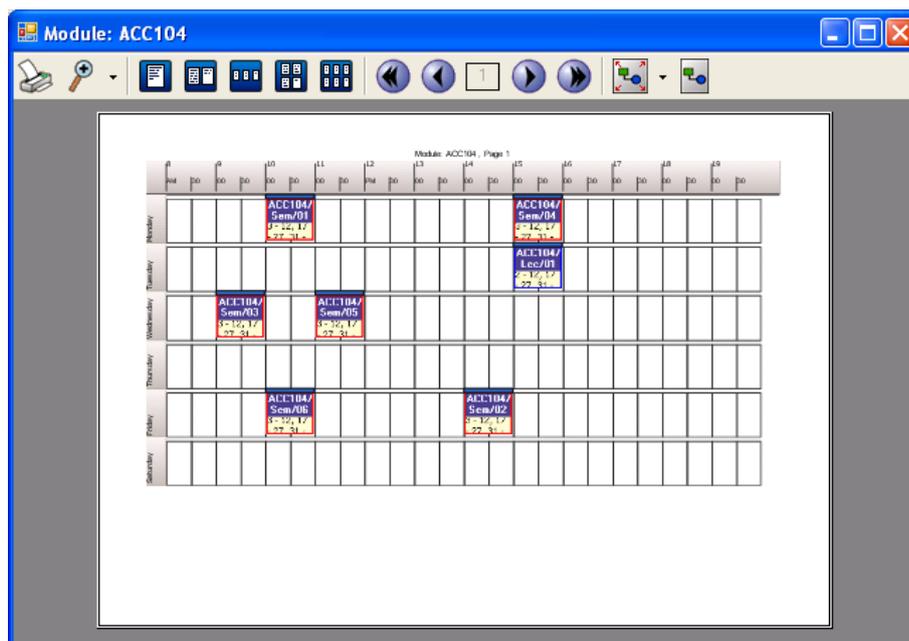
12.5 Printing the Current Timetable

Activity Viewer

View Selector

Current Timetable

Choosing the final option **Current Timetable** will open a different style of preview pane which shows the current selected timetable in Enterprise Timetabler. Again, the page can be configured using the toolbar at the top of the screen.



The screenshot shows a 'Module: ACC104' window with a toolbar and a grid of course sessions. The grid has columns for days (Sun to Sat) and rows for semesters (Sem/01 to Sem/05). The sessions are as follows:

| Day | Sem/01 | Sem/02 | Sem/03 | Sem/04 | Sem/05 |
|-----------|----------------|----------------|--------|----------------|--------|
| Sunday | | | | | |
| Monday | | | | ACC104/ Sem/04 | |
| Tuesday | | | | ACC104/ Lec/01 | |
| Wednesday | ACC104/ Sem/03 | ACC104/ Sem/05 | | | |
| Thursday | | | | | |
| Friday | ACC104/ Sem/02 | ACC104/ Sem/02 | | | |
| Saturday | | | | | |

Figure 148 Print preview of current timetable

End document