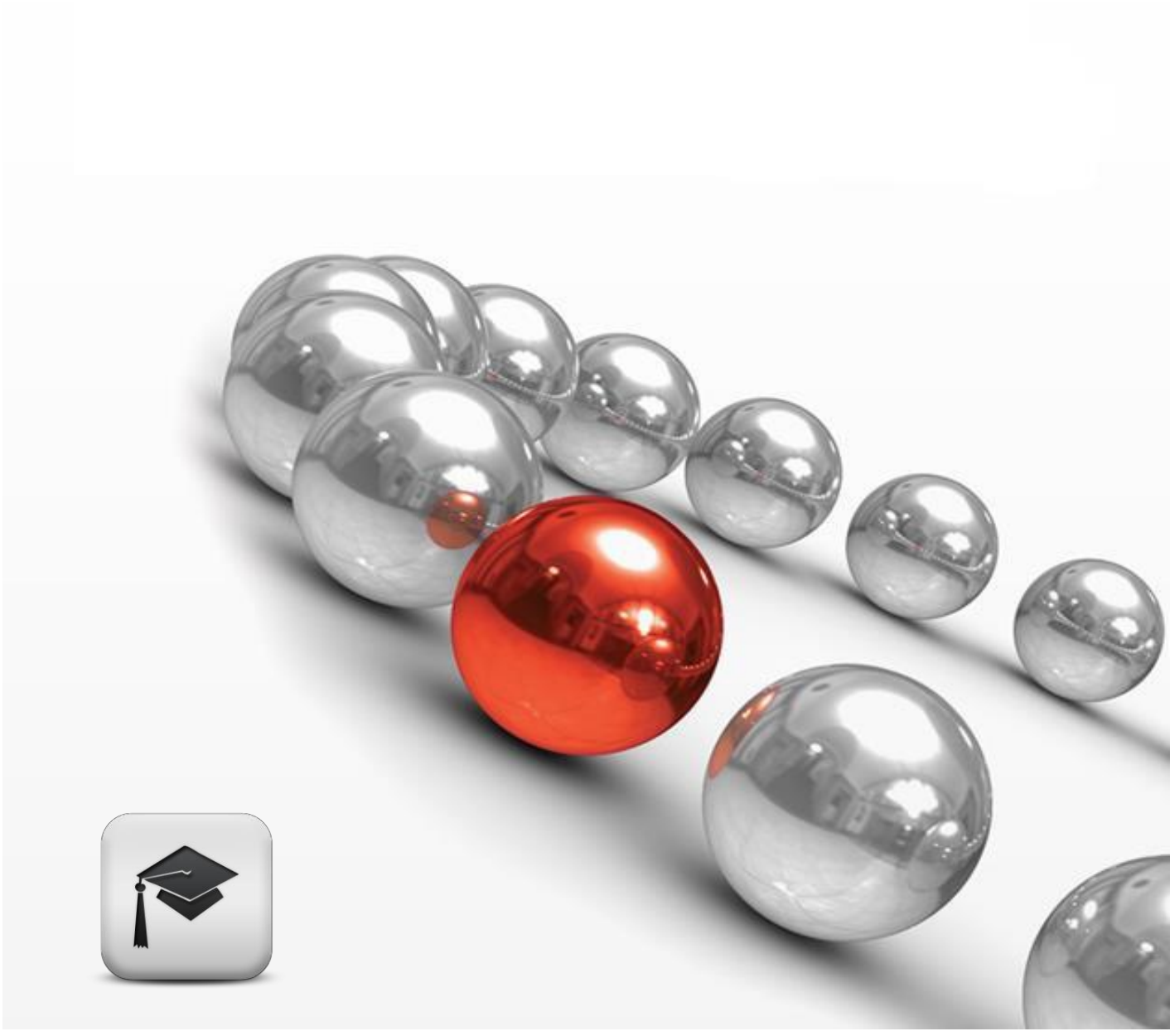
Scientia®

EF

Enterprise Timetabler

Training Guide



Document Summary

Written by	Date	Release	Status	History

Table of Contents

1 Software Overview

Enterprise Timetabler is a graphical interface 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.

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

1.1 Functions available in Enterprise Timetabler

A summary of functions:

- 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

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.

1.3 Enterprise Timetabler Elements

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

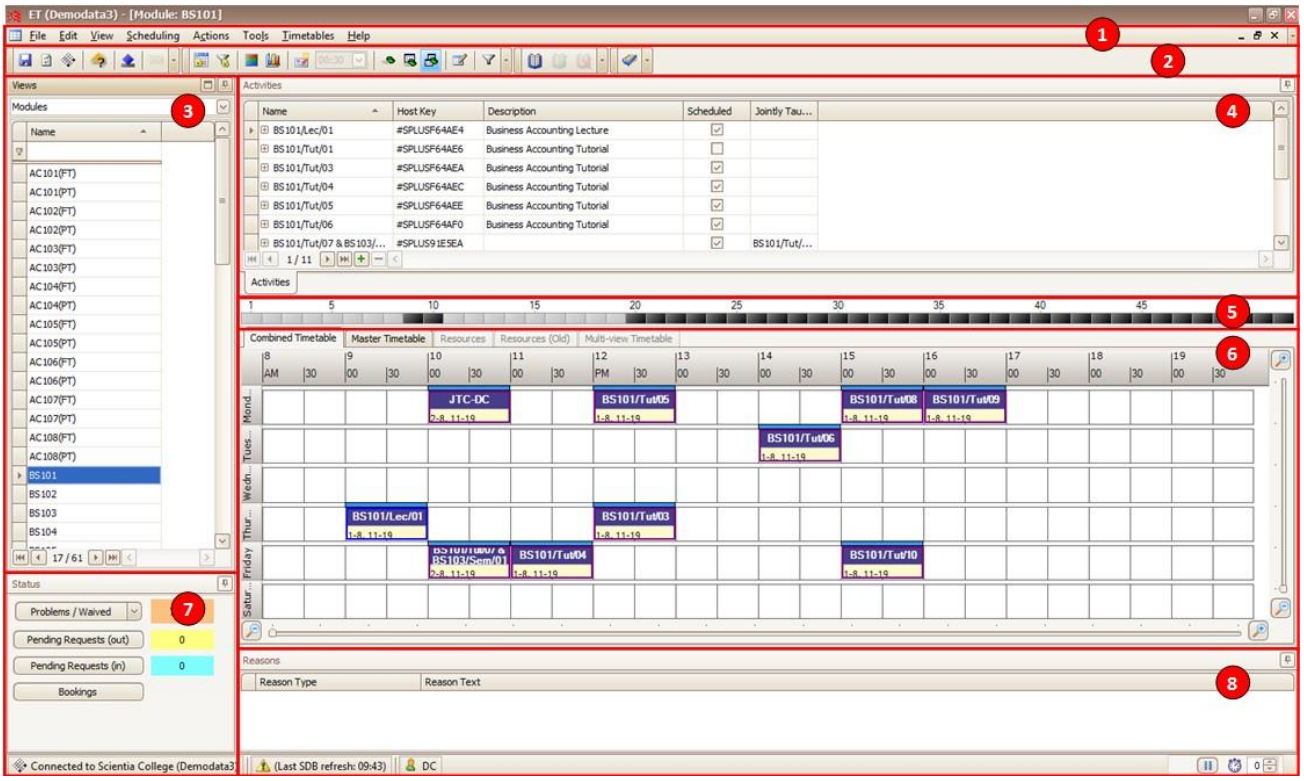


Figure 2 The Enterprise Timetabler interface

1. The drop down menu bar
2. The toolbar
3. The views pane
4. The activity spreadsheet

5. The week pattern bar
6. The timetable grid
7. The status pane
8. The reasons pane

1.4 Drop-Down Menus

The **Drop-down Menu** bar (labelled 1 in figure 1) 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.

1.5 Toolbars

A **Toolbar** 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 Customisation .

Writeback changes to SDB.

Refresh changes from SDB.

Go to S+ (Classic)

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

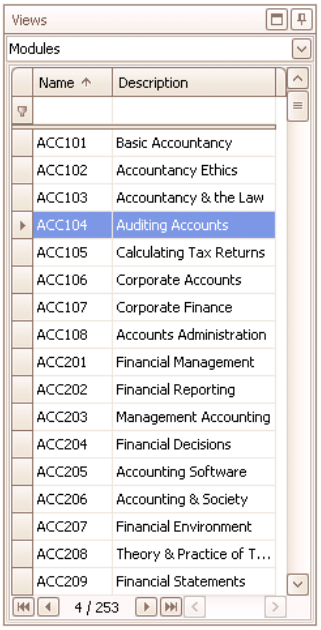
f: C

Toggle booking mode

Confirm booking

Cancel booking

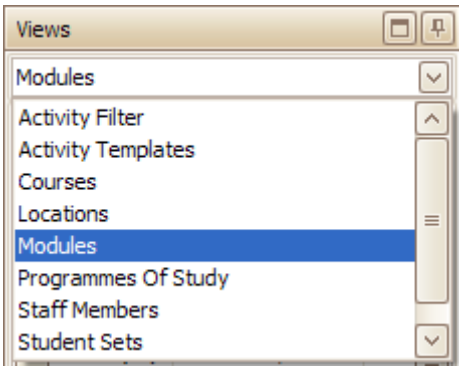
Toggle display of waived problems



Each of the toolbars can be Customised 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.

1.6 Views Pane

The **Views Pane** (labelled 3 in figure 1) enables the user to choose which object type they wish to view.

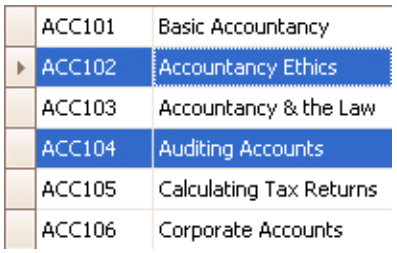


In the illustration shown, the currently viewed object type is *Modules*.

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 5 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.



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** spreadsheet, and those that are scheduled appear on the **Timetable** grid.

Figure 6 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.

1.7 Customisation of the Views Pane

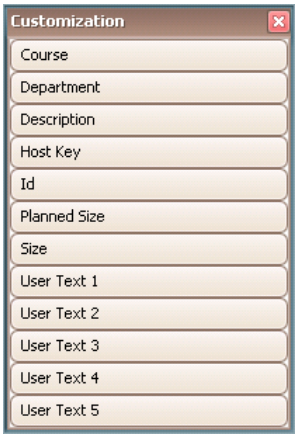
The user can customise the columns of data shown, the order in which those columns appear, the sorting grouping and filtering of items in the Views pane. A detailed description of how to invoke each of these options is given below.

1.7.1 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.

1.7.2 Adding Columns

Figure 7 Customisation control

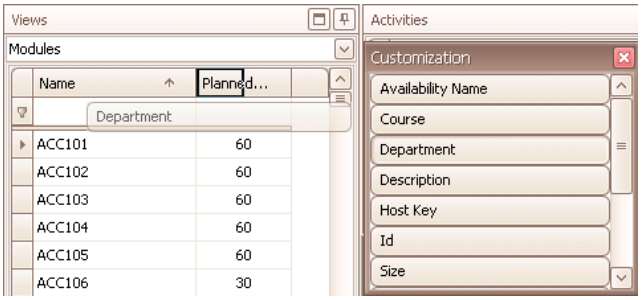


Columns are added to the **Views Pane** by using the *Column Chooser*. A right click on the column header of the **Views Pane** invokes a speed menu. Selecting *Column Chooser* from this menu will open the **Customisation** window.

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 8 Department column being added



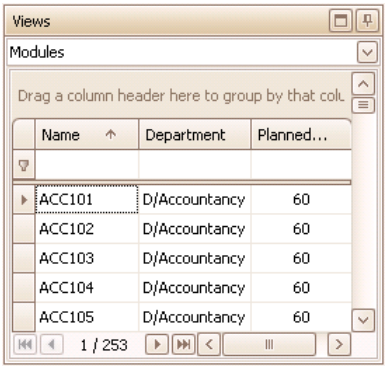
In the illustration shown, the Department column is being added to the right of the Name column.

1.7.3 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.

1.7.4 Grouping

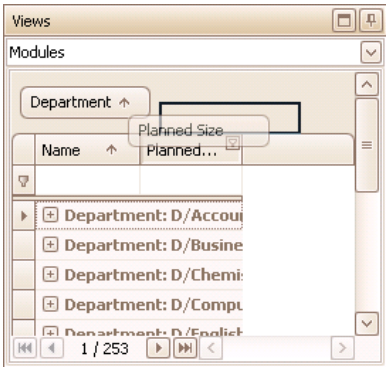
Single level grouping can be achieved by a right-click on the column header of the desired column. Select Group By This Column to group the objects by the selected column.



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.

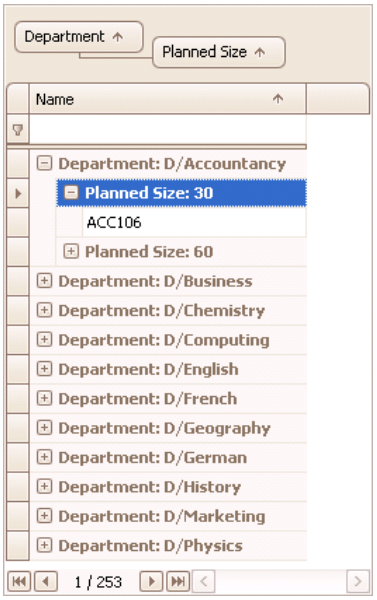
Figure 9 Object list with Group By Box enabled



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 10 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

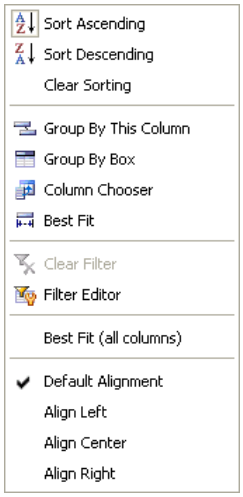


& symbols.

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

Figure 11 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.

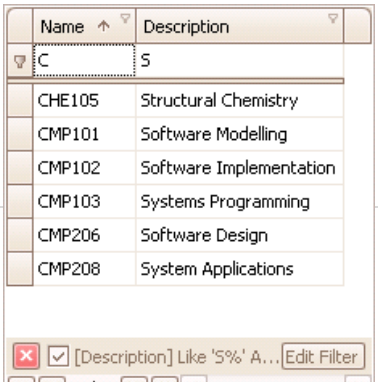
Alignment of the information contained in each column can be adjusted as required.

1.8 Filtering Objects in the Views Pane

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

1.8.1 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.

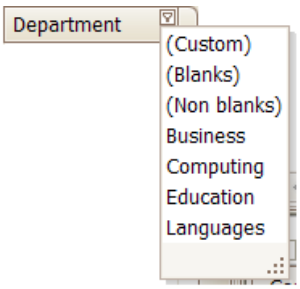


Figure 13 Finding objects using "Like" filter

1.8.2 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.

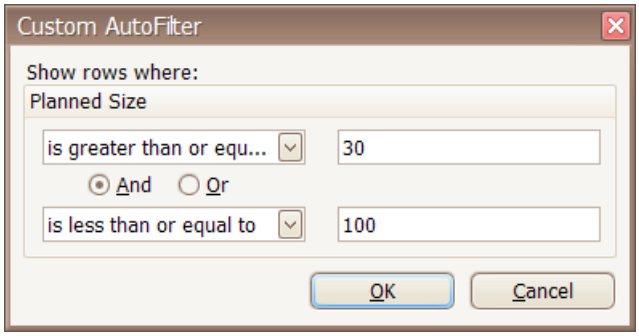
Selecting one of these values will filter the list to show only objects matching that value. The list also allows filtering to find objects where the value is blank or not blank.

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

Figure 14 Filtering by matching content

1.8.3 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 15 Custom filter control

1.8.4 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 16 Filter Builder

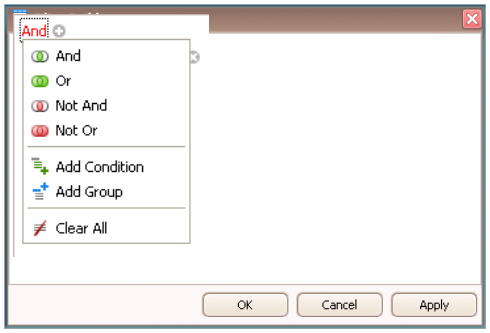
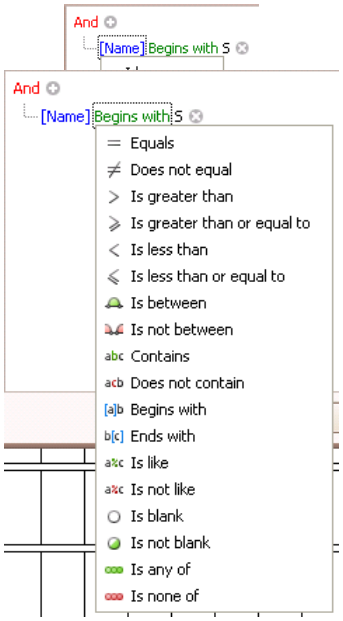


Figure 17 Filter groups

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



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

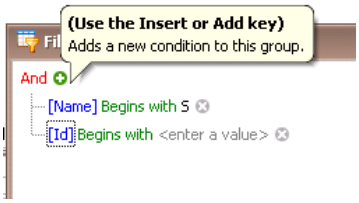
Figure 18 Filter properties

Figure 19 Filter conditions

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

Figure 20 Adding a condition

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



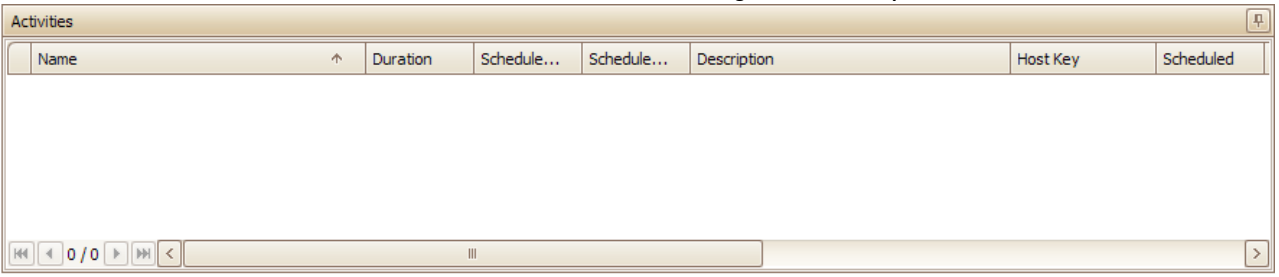
Clicking on the symbol removes the relevant filtering condition.

Figure 21 Removing a condition

1.9 Activities Spreadsheet

The **Activities** pane (labelled 4 in figure 1), blank in the opening screen, is located horizontally across the top part of the timetabler.

Figure 22 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*.

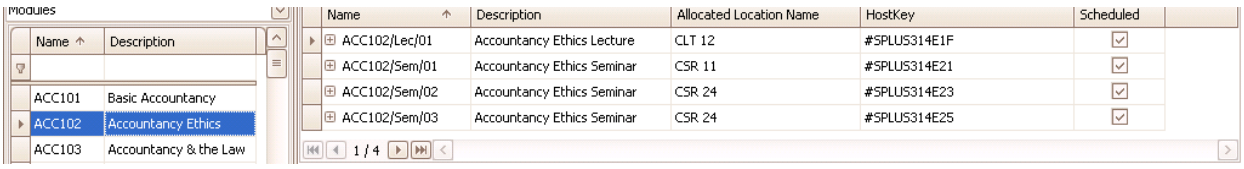
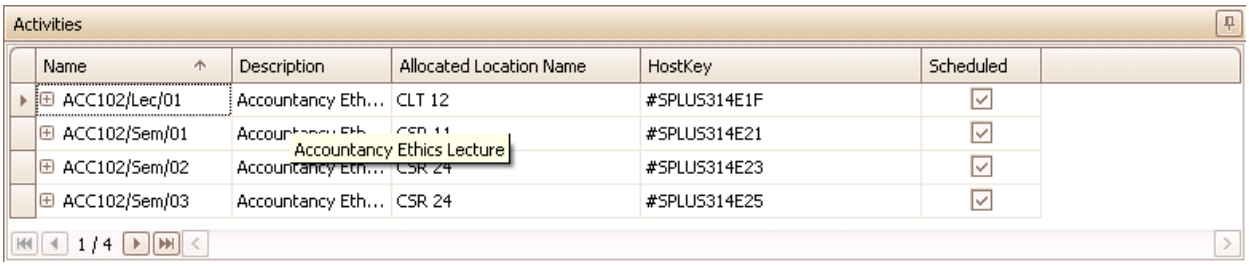


Figure 23 Activities pane populated

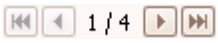
Activities can be selected from the spreadsheet using the mouse. When the information contained in a

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.

Figure 24 Additional detail shown by hovering



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

Figure 25 Navigation buttons

1.9.1 Customisation of Activities Spreadsheet

The columns displayed in the **Activities** spreadsheet can be customised 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 section 1.7.

When filtering has been applied to the **Activities** spreadsheet, the user may or may not wish the same filter criteria to be used when a new object is selected (and hence the spreadsheet is repopulated). The  button on the toolbar allows the user to toggle between the filter being in "locked" mode (same filter criteria will be applied when a new object is selected) or "unlocked" mode (newly opened object will display an unfiltered activity spreadsheet).

1.9.2 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.

1.10 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.

1.10.1 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.

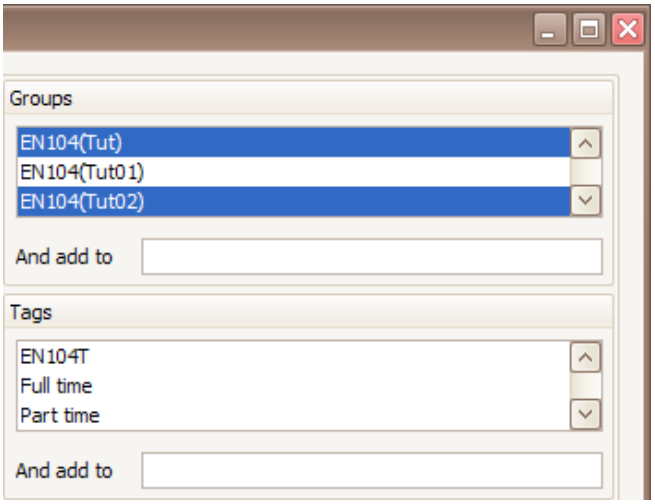


Figure 26 Groups and tags

1.10.2 Tagging

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.

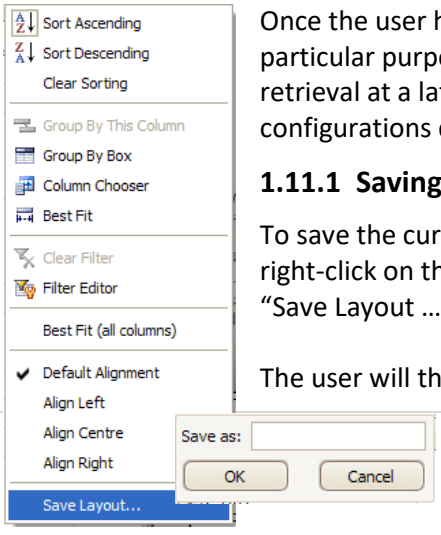
If the name typed in this field is not the name of an existing group then a new group will be created, with that name, and the activity(ies) will be added as members of that group.

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.

1.11 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.

1.11.1 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. Layouts can be saved to your hard drive.

Figure 27 Saving a layout

1.11.2 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.

1.11.3 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.

1.12 Week Pattern Bar

The **Week Pattern** bar (labelled 5 in figure 1) 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 28 Yellow marker indicating current week

1.12.1 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 29 Week bar in module view

1.12.2 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, click and drag the mouse along the week bar. Each week over which the mouse passes will be selected or, if you start by clicking on a selected week, deselected.

A right-click above the week bar gives access to a number of short cuts to week selection as shown below.

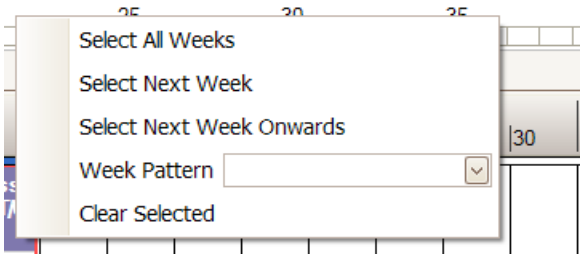


Figure 30 Week selection options

Choosing *Select All Weeks* will select all the weeks in which the currently selected activity is scheduled. If no activity is selected then no weeks will be selected.

Choosing *Select Next Week* will select the next week in which the currently selected activity is scheduled. The definition of next is based on the system date of the client machine.

Choosing *Select Next Week Onwards* will select all of the weeks in which the activity is scheduled from the next week (based on the system date) onwards.

The *Week Pattern* option allows the user to select from a list of named week patterns. These patterns are created in Enterprise Reference Data Manager.

The *Clear Selected* option allows the user to deselect all the currently selected weeks in order to begin a new selection.

1.12.3 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.

1.12.4 Linking the Weeks of Open Timetables

In normal use the weeks selected in each open timetable are independent of each other so that a user might be viewing a module timetable for a whole semester while another timetable shows the activities of a location for a single week.

If the user prefers the selected weeks of open timetables to be linked they can select the *Weeks linked* option from the Application tab of the Options window as shown. This is accessed from the Tools menu.

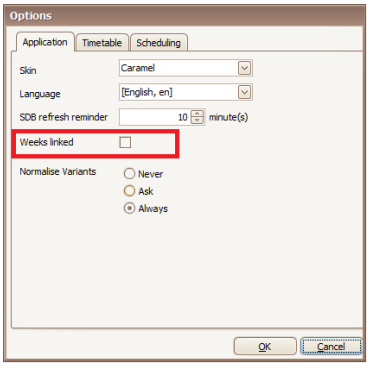


Figure 31 Weeks linked option

The effect of enabling this option in combination with the lock weeks option is that changes made to the selected weeks in one open timetable will affect all other open timetables so that the viewed weeks are the same for all open timetables.

1.12.5 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 32 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 33 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 34 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.

You can use the Week Pattern bar in Enterprise Timetabler 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.

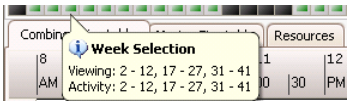


Figure 35 Week selection tooltip

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.

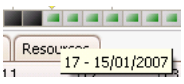


Figure 36 Week label and start date tooltip

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 37 Week selection tooltip in variant mode

1.13 Timetable Grid

On opening Enterprise Timetabler, a blank **Timetable** grid (labelled 6 in figure 1) will appear. Days appear down the left –hand side and times across the top of the grid.

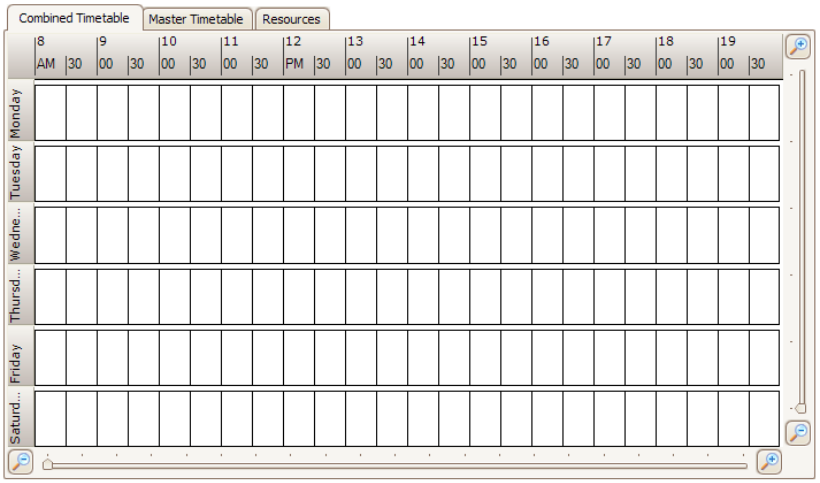


Figure 38 Timetable grid

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.

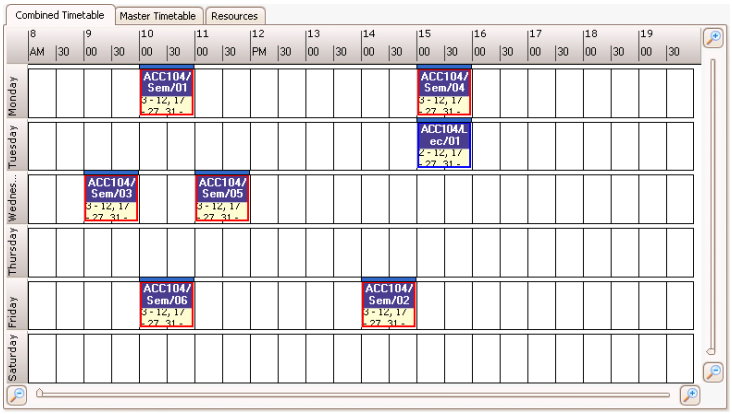


Figure 39 Timetable grid displaying activities

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.

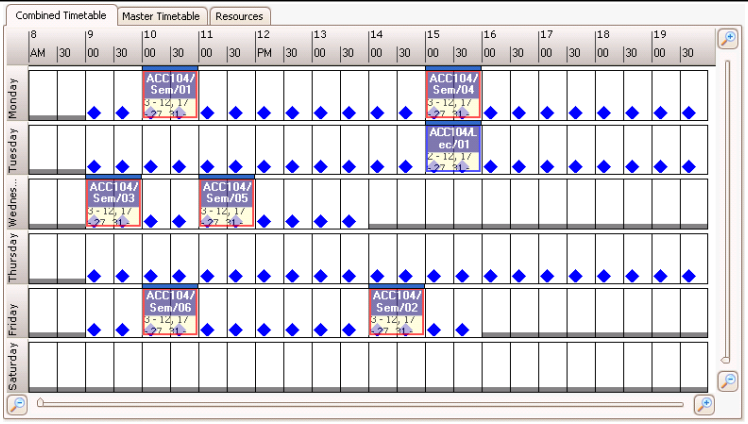


Figure 40 Timetable grid showing potential start times for a new activity

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.

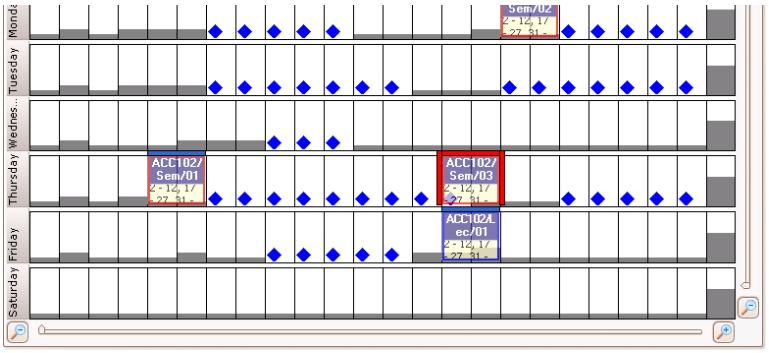


Figure 41 Timetable grid with activity selected

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.

1.13.1 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 members 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.

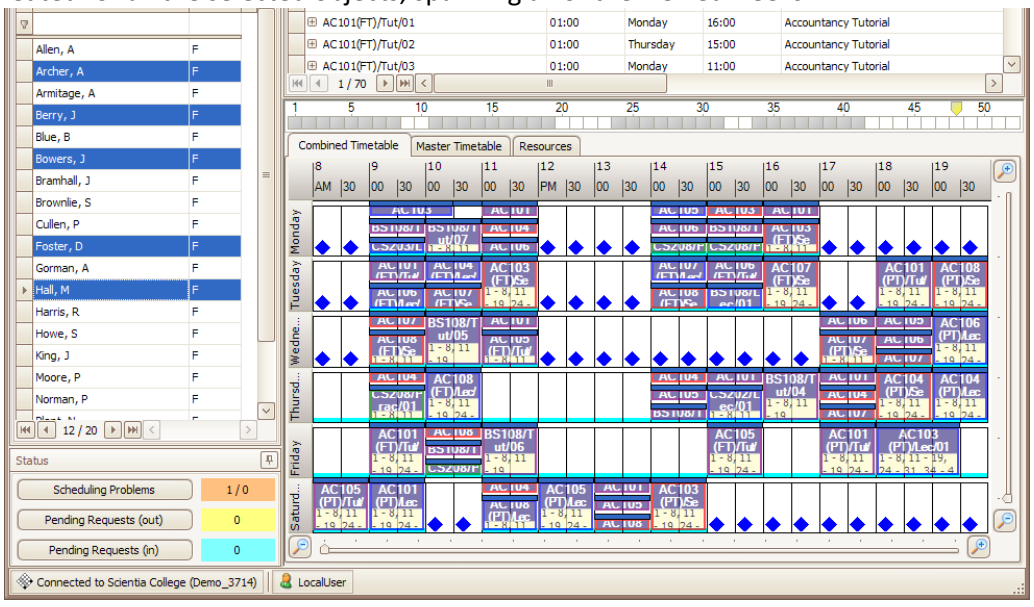


Figure 42 Timetable grid - combined view

1.13.2 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**.

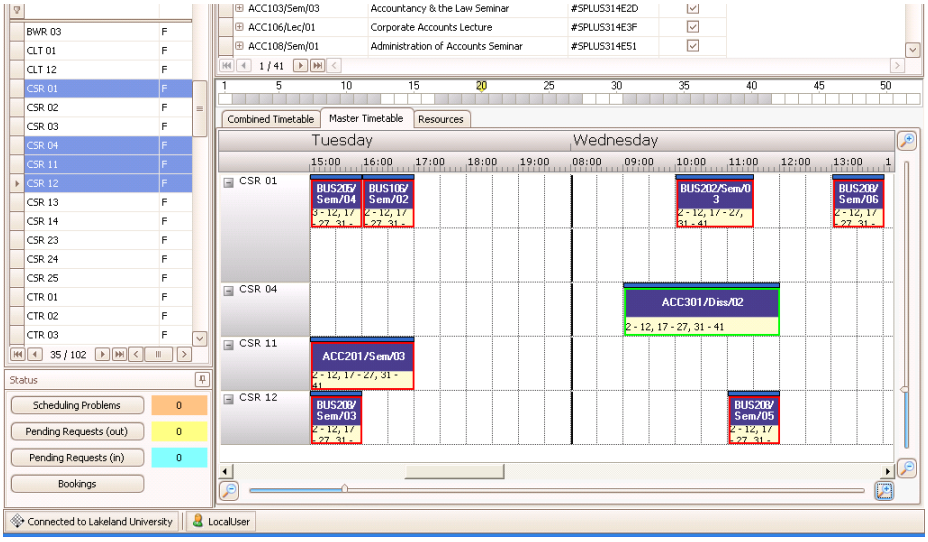


Figure 43 Timetable grid - master view

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.

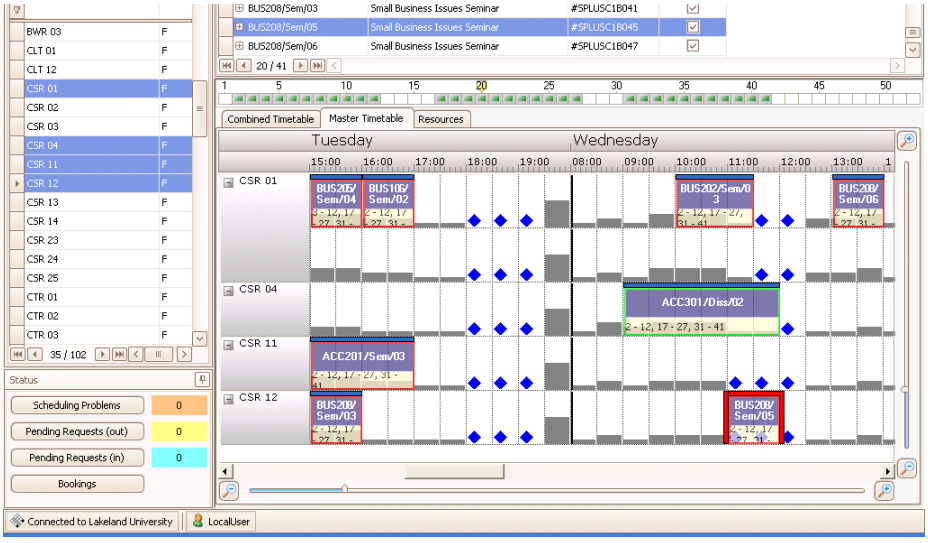


Figure 44 Master view with activity selected

1.13.3 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 3.

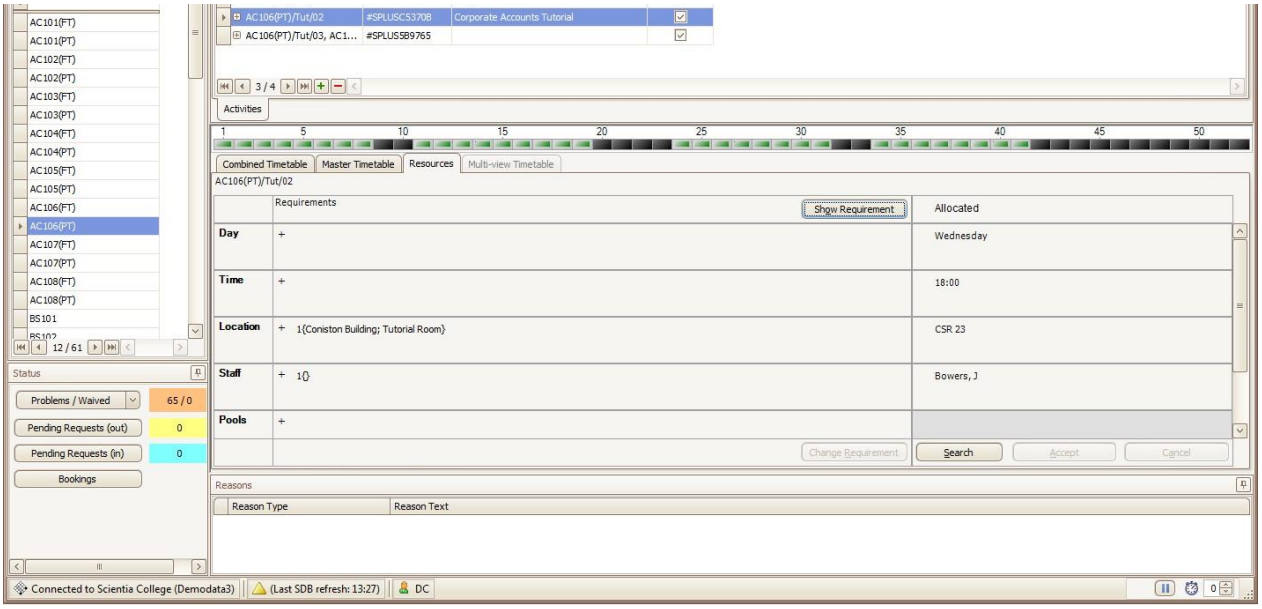


Figure 45 Resource tab

1.13.4 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.

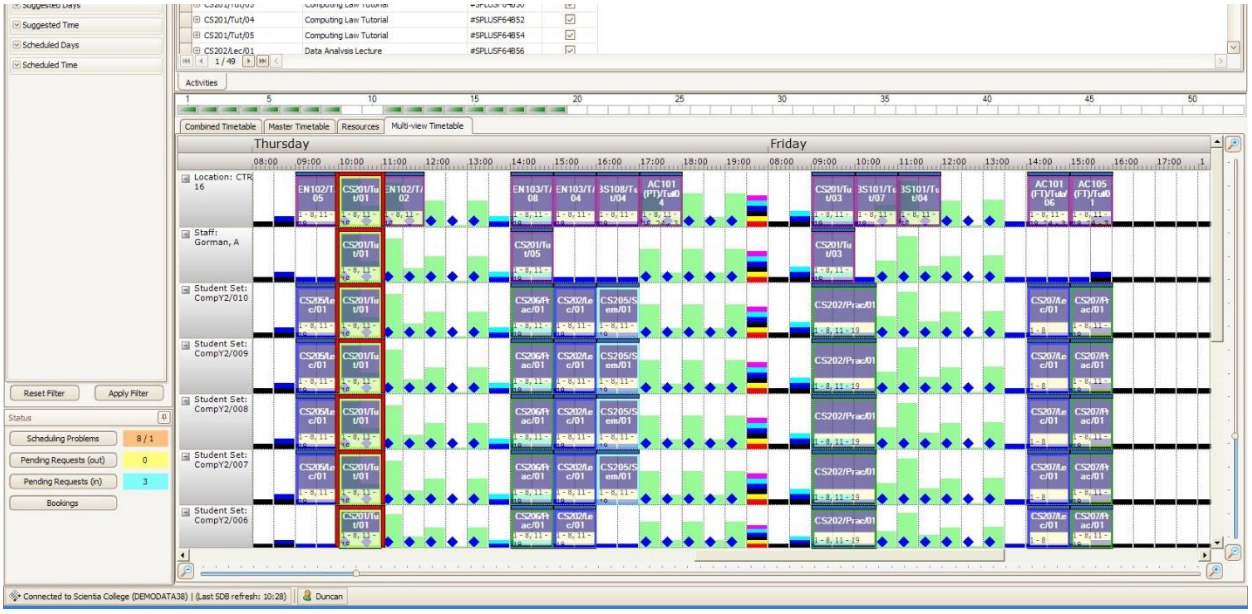


Figure 46 Multi-view timetable

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.

When a multi-view timetable is selected, a new window is opened on top of the timetable view(s) currently in use. In order to revert to that previous view the user must close the multi-view timetable using the grey cross in the top right hand corner of the window (positioned just below the red cross that closes the application).

1.13.5 Viewing times

An institution setup may include times, such as weekends, early mornings and late evenings, that are used for ad-hoc bookings but rarely used for academic scheduling. In such cases it may be convenient for the user to exclude certain times from the master and multi-view timetables.

The Timetable tab of the Options window (available from the Tools menu) allows the user to select which days and hours are included in these views.

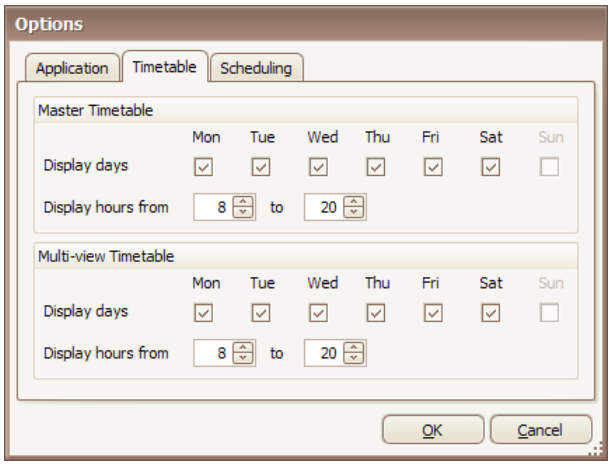
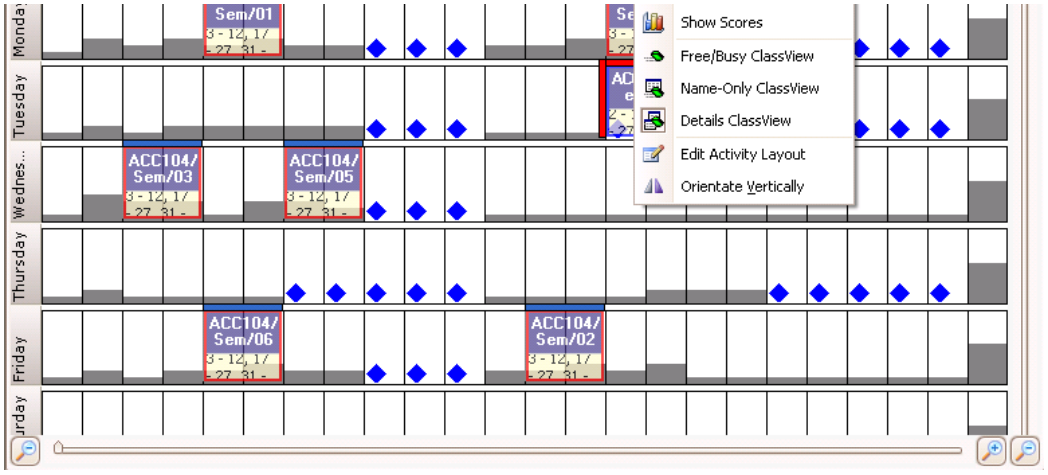


Figure 47 Select viewing times

1.14 Different Timetable Styles

Combined and *Master* timetables can be Customised 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 Customisation options to be selected.



1.14.1 Edit Activity Layout

Figure 48 Timetable grid - Customisation options

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.

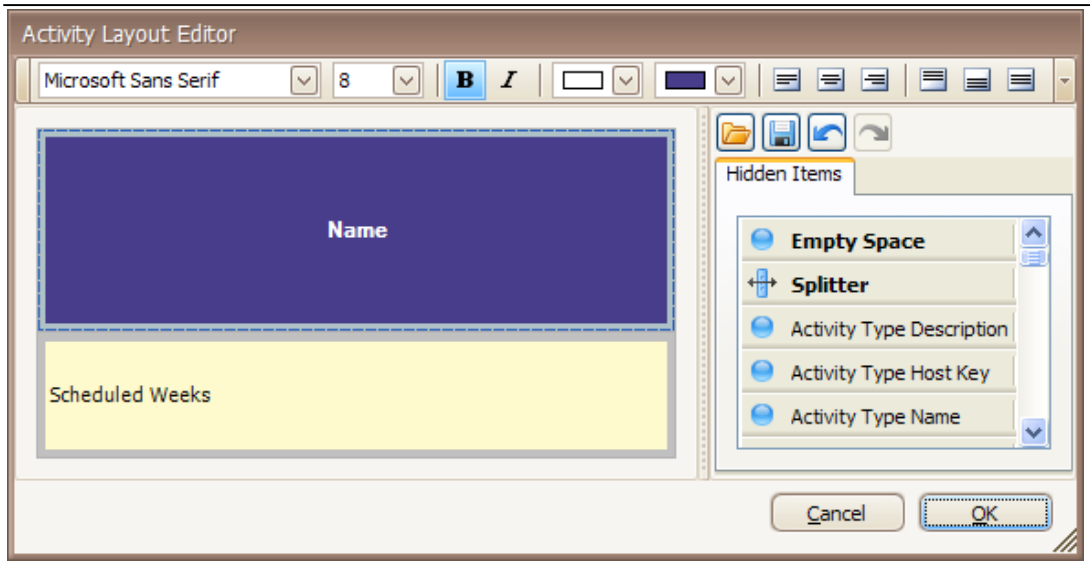


Figure 49 Activity Layout Editor

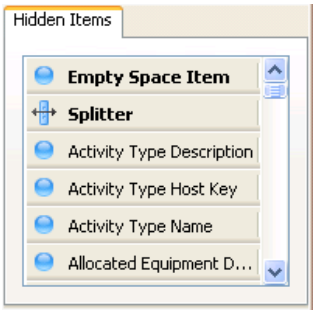
The toolbar across the top of the editor can be used to change the appearance of the activity cells.

Figure 50 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 Top, Align Bottom, Align Middle)
- Position the font horizontally (Align Left, Align Middle, Align Right)

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



In the *Hidden Items* palette, the **Splitter** can be used to split cell either vertically or horizontally. A splitter will insert an empty space between itself and the edge of the cell.

The **Empty Space Item** can be used to create an empty space within the cell. In many ways its behaviour is like that of a splitter but the empty space can be inserted between two cells, giving the user control over the positioning of both edges of the empty space.

Figure 51 Hidden items list

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

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

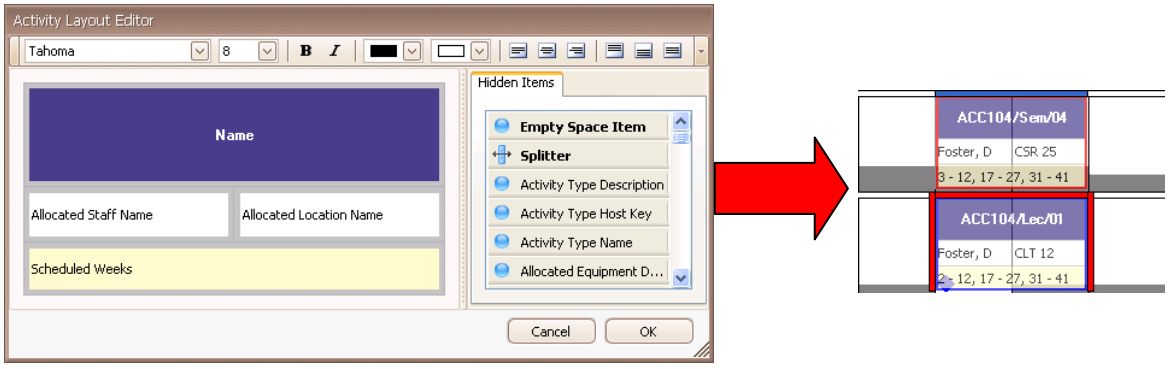


Figure 52 Applying the changes

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.

1.14.2 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.

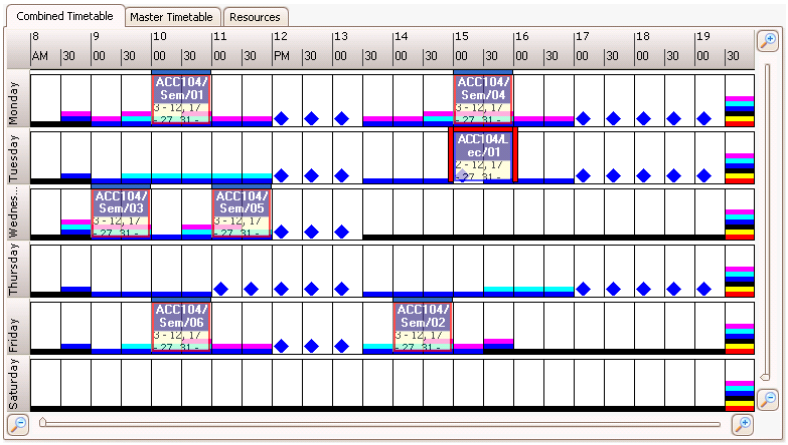
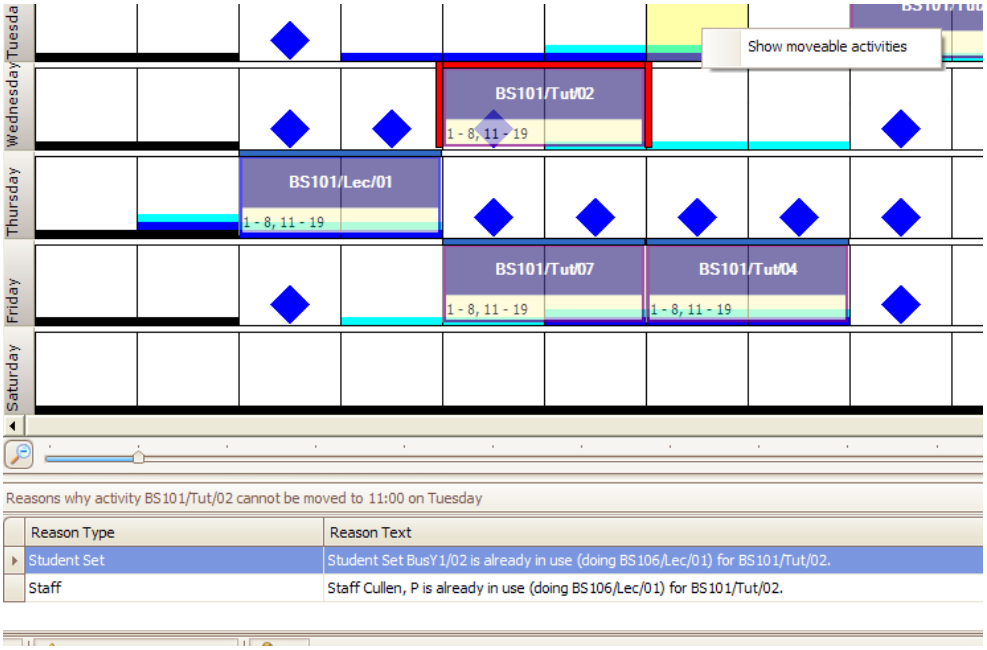


Figure 53 Timetable grid - coloured constraints



Right-clicking on any of the section of the timetable which contains coloured bars will show more detailed reasons why the activity cannot be scheduled at the selected time. This information is displayed in a separate window that, by default is docked at the bottom of the timetable grid. As with other elements of the interface the window can be moved to an alternative position if preferred.

Figure 54 Reasons for unschedulability

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.

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 resources.

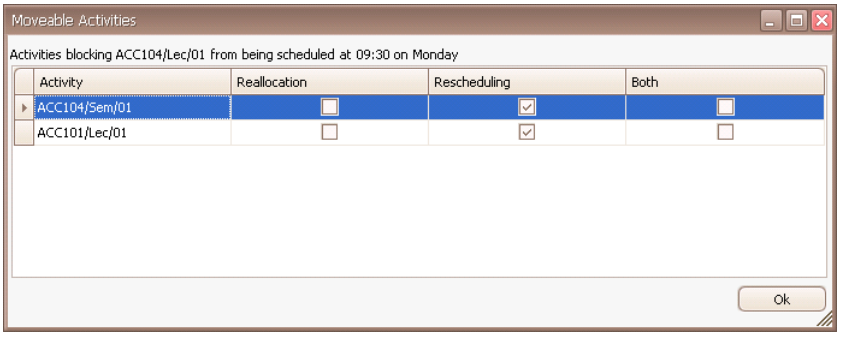
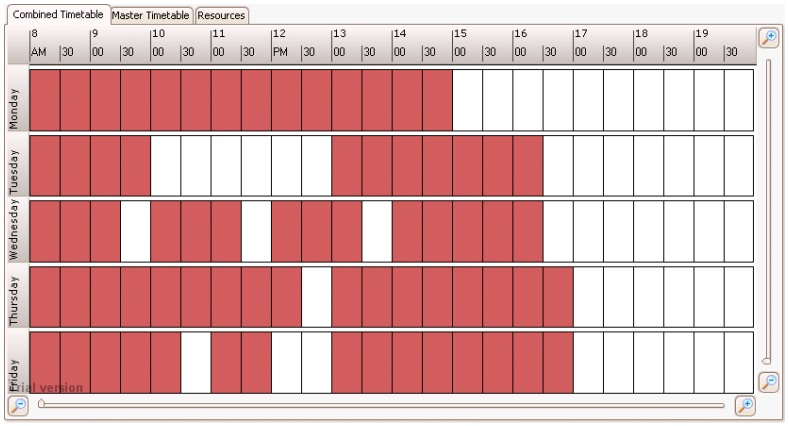


Figure 55 Moveable activities window

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).

1.14.3 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 56 Timetable grid - free/busy view

1.14.4 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.

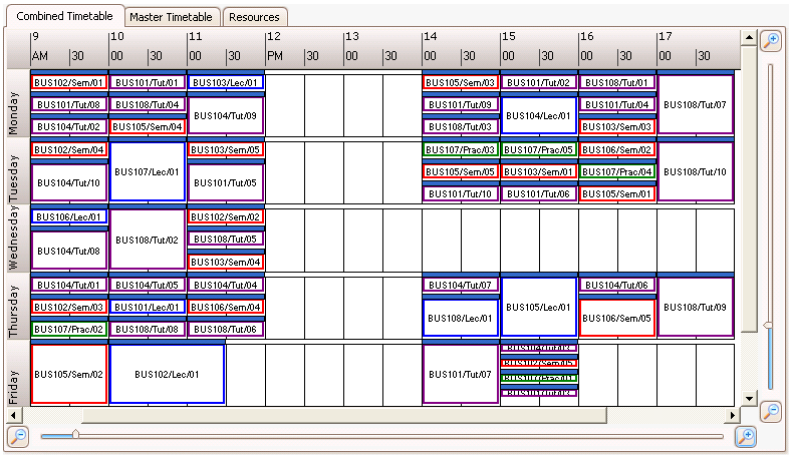


Figure 57 Timetable grid - name-only view

1.14.5 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**.

1.14.6 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.

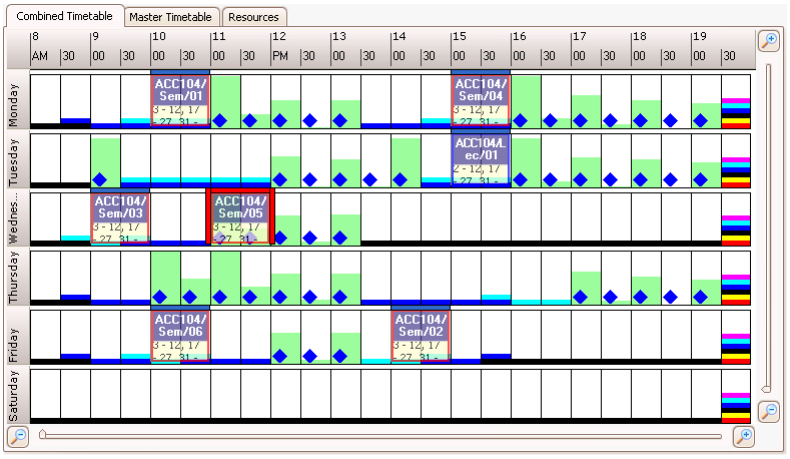
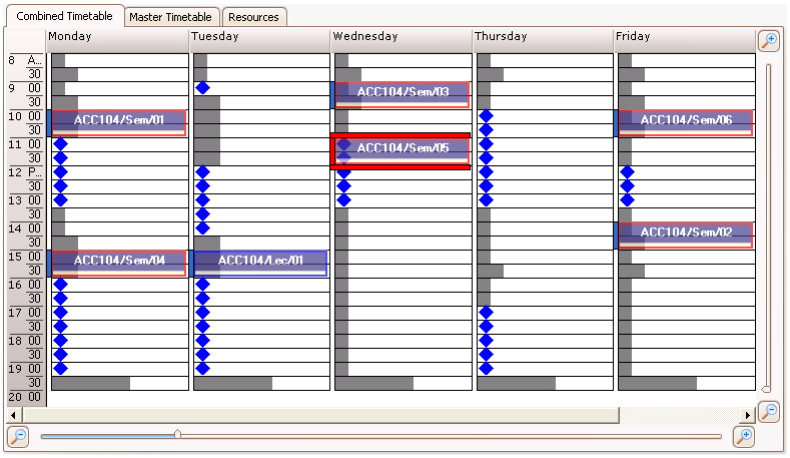


Figure 58 Timetable grid showing relative scores

1.14.7 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 59 Timetable grid - vertical orientation

1.15 Status Pane

The **Status** pane (labelled 7 in figure 1) 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.

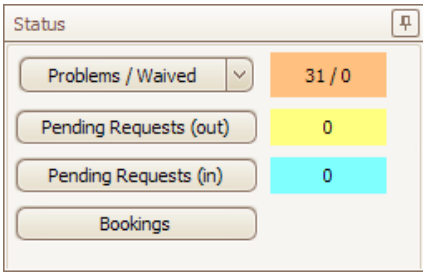


Figure 60 Status pane

Clicking on the *Scheduling Problems* button will filter activities to show in the Activities spreadsheet only those activities that have scheduling problems. Clicking on the dropdown arrow to the right of the button will give access to the filter options as shown below:

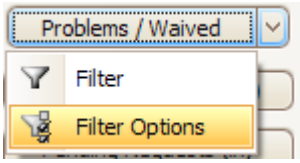


Figure 61 Filter options

This allows the user to define their preferred view of the problems list. A window is displayed that shows all of the current problem types. The user can select (using checkboxes) which of the problem types they are interested in viewing.

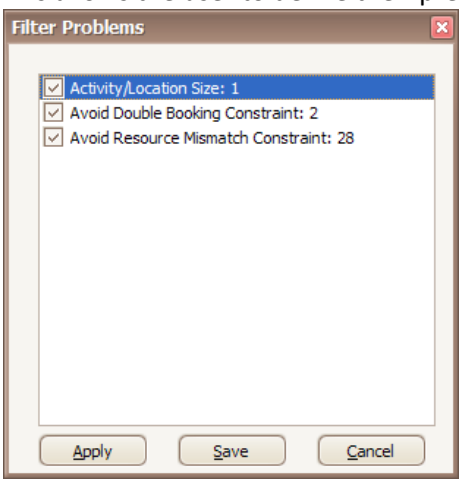


Figure 62 Problems filter

Making changes in this window and clicking apply will show the selected problem types only as a one-off operation. Clicking the save button will remember the settings of the filter and apply them each time the problems button is clicked. Once the problems are displayed, the user can apply more selective filtering to narrow the list further.

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 8.20.

1.16 Reasons pane

The Reasons Pane (labelled 8 in figure 1) shows the user reasons why the currently selected activity should not be scheduled at the currently highlighted time. The user can select an activity with a left click, either in the timetable pane or in the activity spreadsheet. A time slot to examine is selected with a right click. The reasons pane will then update to show the list of reasons preventing scheduling at the selected time and the user will see an additional option to show details of the activities that could be moved to resolve the blocking issues.

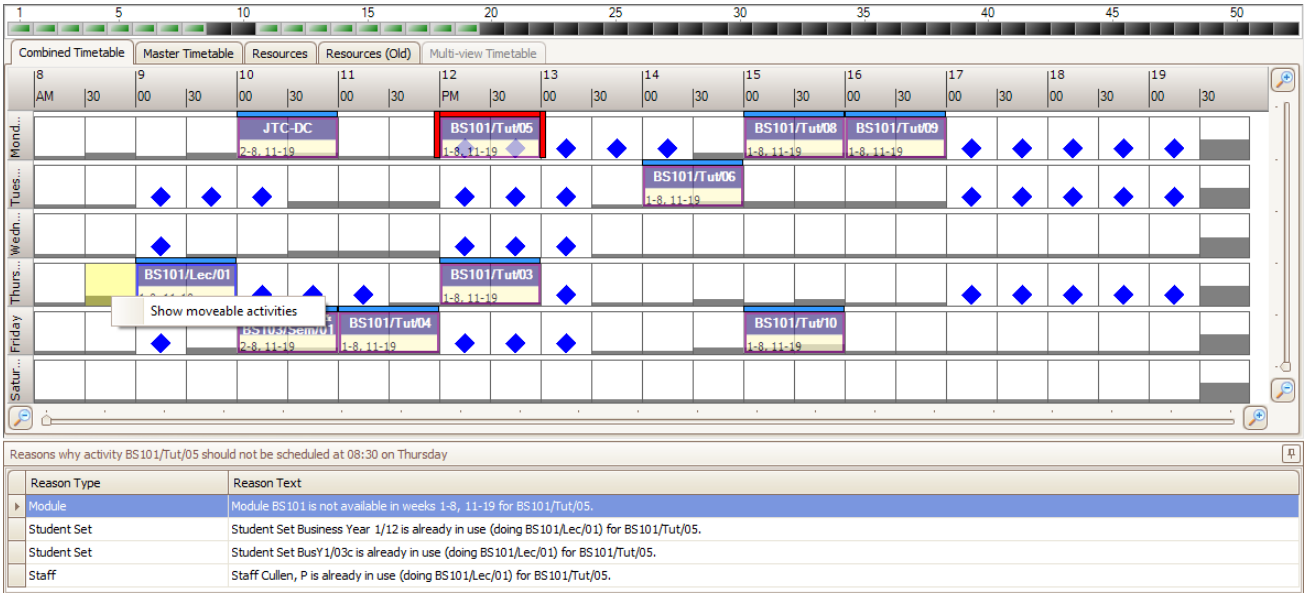


Figure 63 - Reasons pane

When an activity is first selected, the reasons pane will usually be empty, since there are no constraints preventing the activity from being scheduled at its current day / time. The exception to this rule is an activity that has been scheduled with a problem. In this case, the problem or problems currently being tolerated will be displayed in the reasons pane.

1.17 Links to Other Applications

Some of the data that is shown in Enterprise Timetabler can only be edited in other Enterprise applications. The object view, for example can be set to show a list of modules and the user can add columns to see various properties of the module but, in order to change a property of a module, the user must use the Enterprise Course Planner application.

To access the data in the application where it can be edited, the user has access to a shortcut on the right mouse button. A right click on the module in the views list , for example, will open a menu like this:

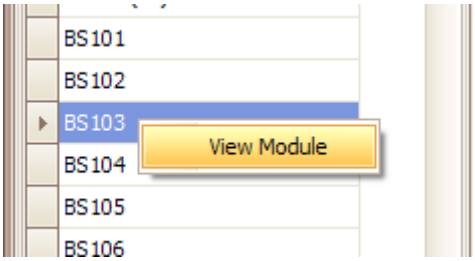


Figure 64 View module from ET

By selecting the option, the user will switch from Enterprise Timetabler to Enterprise Course Planner and focus on the selected module. If Enterprise Course Planner is not currently running, the user will receive a message warning that the application has to be running in order for the function to work.

Similarly, a right click on a location or staff member will allow the user to switch to Enterprise Desktop Reference Data Manager to view the object and change its properties in that application. Again the application must be running for the function to work.
Since Enterprise Timetabler allows the user to see a wide selection of properties, but not to change them, it would be wise to consider which users should be granted permission to run the other Enterprise applications. Users that should not be allowed to change the capacity of a location (which can be seen but not changed in ET) or to add new locations, for example, may not need permission to run Reference Data Manager.

A right click on an activity, either in the timetable grid or in the activity spreadsheet, gives access to a sped menu that allows the user to open a window showing details of any of the objects associated with the selected activity.

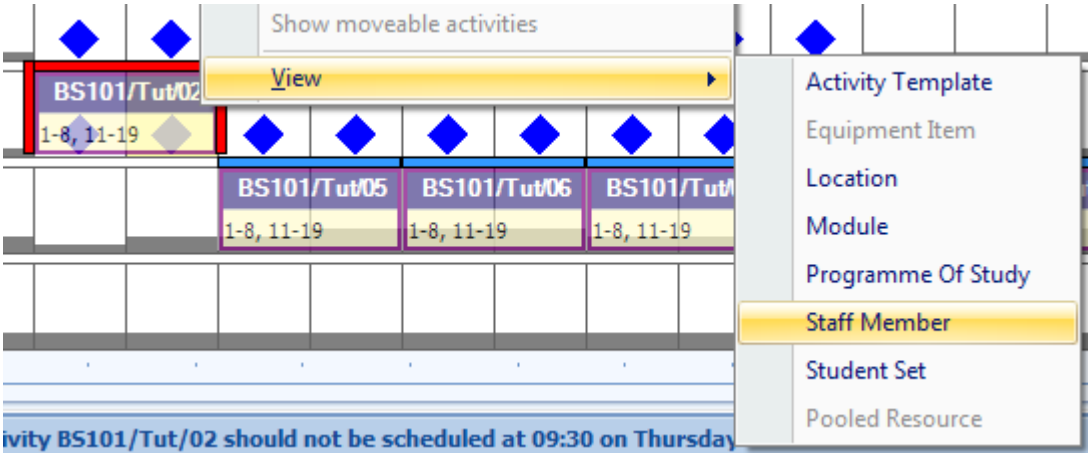


Figure 65 Link to related objects from ET

2 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.

2.1 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.

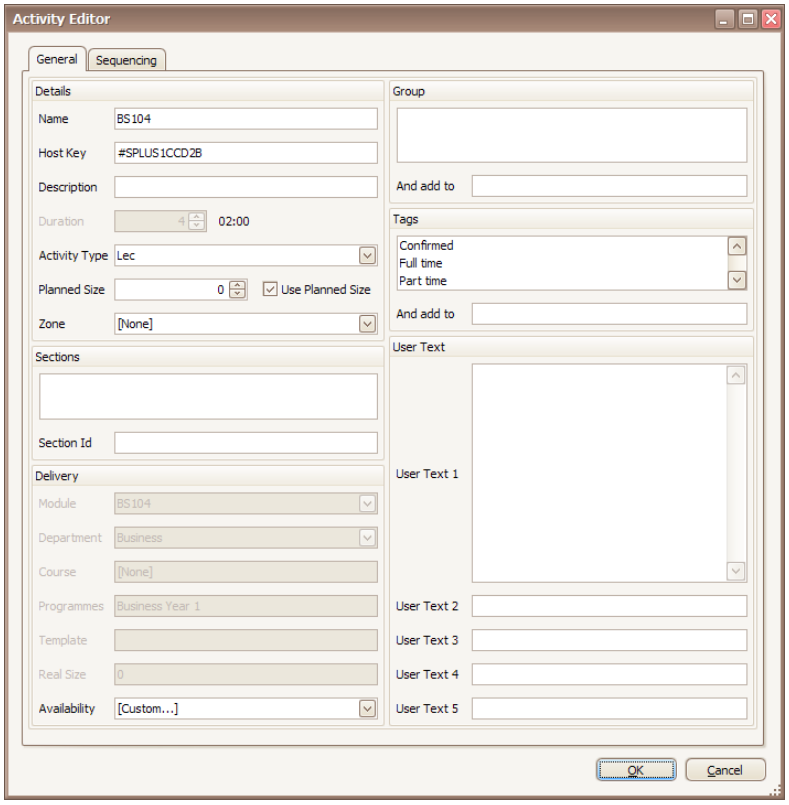


Figure 66 Activity Editor

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 name of the newly created activity will, by default, be the name of the object that was selected when the new activity was created. If several objects were selected then the default name will be the name of the first selected item in the object list. The user may modify or replace the name if desired.
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.

2.1.1 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.

2.1.2 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.

2.1.3 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.

2.1.4 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 2.8.

2.1.5 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**.

The user may set a default activity type if desired. This option is set using Tools | Options | Application | Default Activity Type. Having selected a type, all new activities created will default to that type.

2.1.6 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 2.1.9 for an explanation of real size.

2.1.7 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**.

2.1.8 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.

2.1.9 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 2.1.6 then the real size will be used to determine the capacity of room required, rather than the planned size.

2.1.10 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:

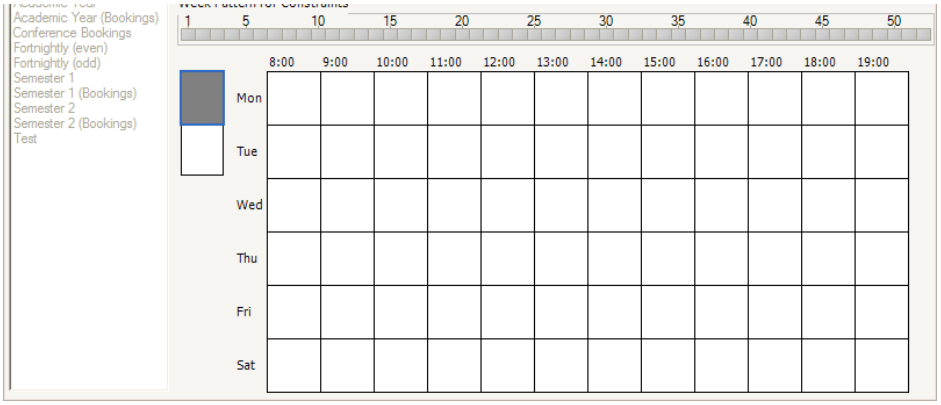


Figure 67 Activity availability

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.

2.1.11 Activity Groups and Tags

Associating activities with groups and tags is explained in section 1.10

2.1.12 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.

2.2 Inter-activity relationships

It is possible to set constraints between activities in terms of their relative timing using the *Sequencing* tab of the Activity Editor as shown below:

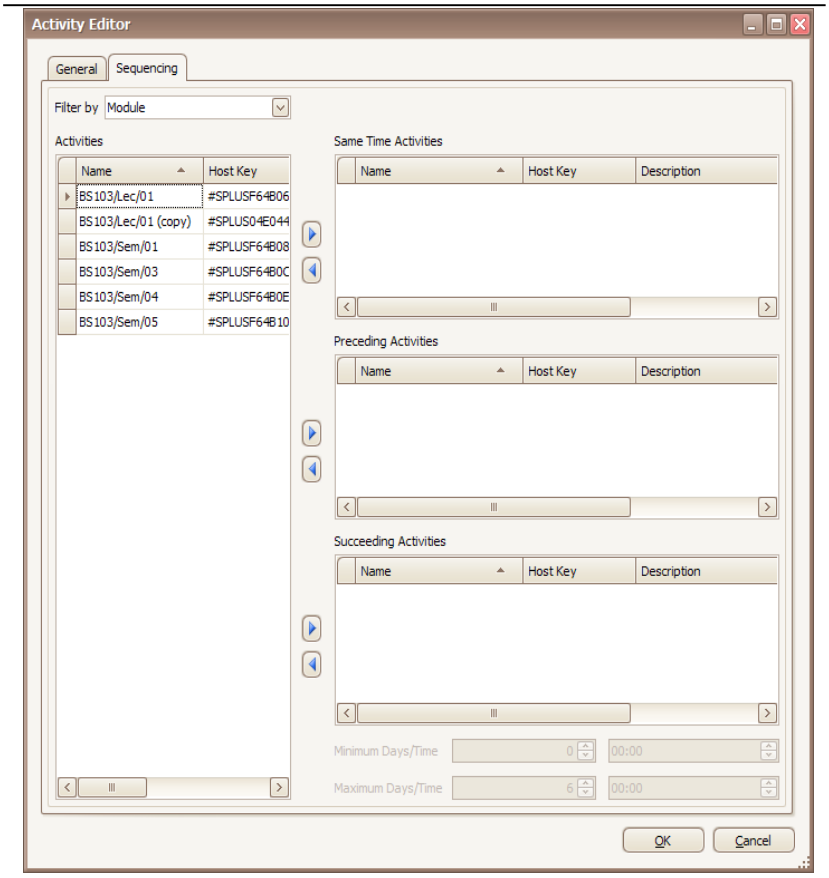


Figure 68 Sequencing constraints

The list of activities shown to the left of the tab is a list of candidates; activities that could be in a relationship with the currently selected activity. The list of candidates is filtered, by default, on the basis of the module so that only activities of the same module as the selected activity are presented as candidates. The user can select other filter options from the dropdown selection list or remove the filter completely by selecting the None option.

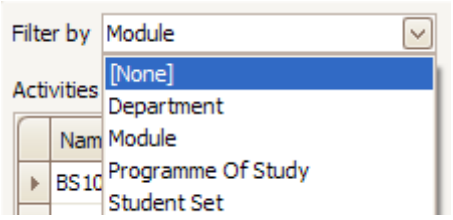


Figure 69 Filter options

2.2.1 Same-time Activities

By selecting an activity or activities from the candidate list and using the squirter buttons to add them to the Same Time Activities list the user creates a relationship between the activities. Whenever they are scheduled, from this point forward, they will be scheduled at the same time. Moving one of the activities to a different time will move all of the other activities in the same-time relationship, too.

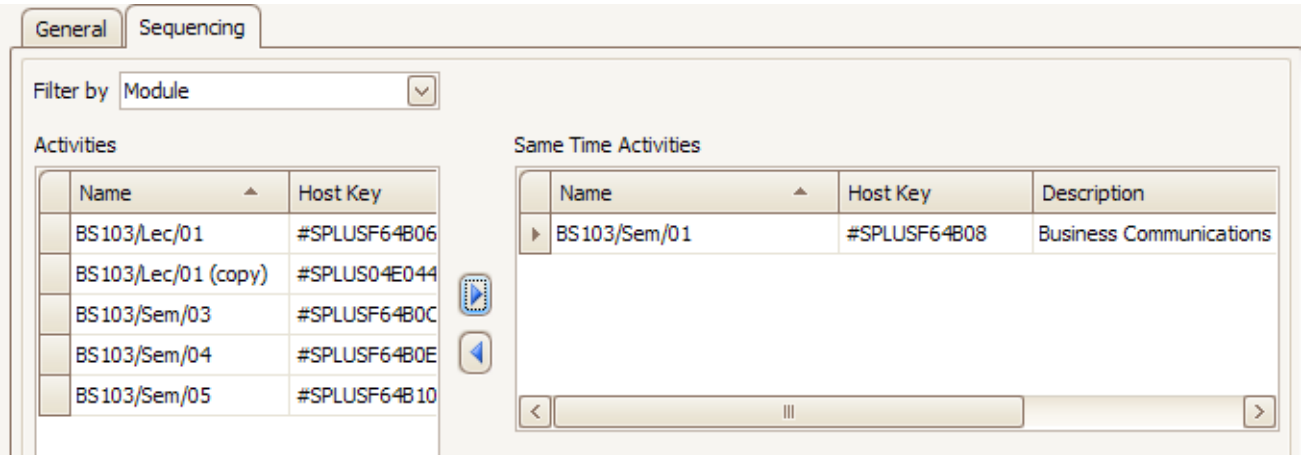


Figure 70 Setting same time relationship

If, activities are already scheduled at different times when the user creates the same time relationship then the activities will have a scheduling problem.

2.2.2 Preceding Activities

By adding an activity from the candidate list to the Preceding Activities list the user specifies that the activity must precede the currently selected activity. Note that this constraint considers only day and time within the week and ignores the week pattern of activities. To be considered a predecessor, therefore, an activity must be scheduled at a day / time that is earlier in the week, whether or not its week pattern is earlier in the year.

2.2.3 Succeeding Activities

A succeeding activity is one that is scheduled at a day / time that is later in the week than the currently selected activity. The required gap between the predecessor and the successor is always set from the perspective of the predecessor activity so that when a succeeding activity is selected the controls that allow the user to specify the required gap become active.

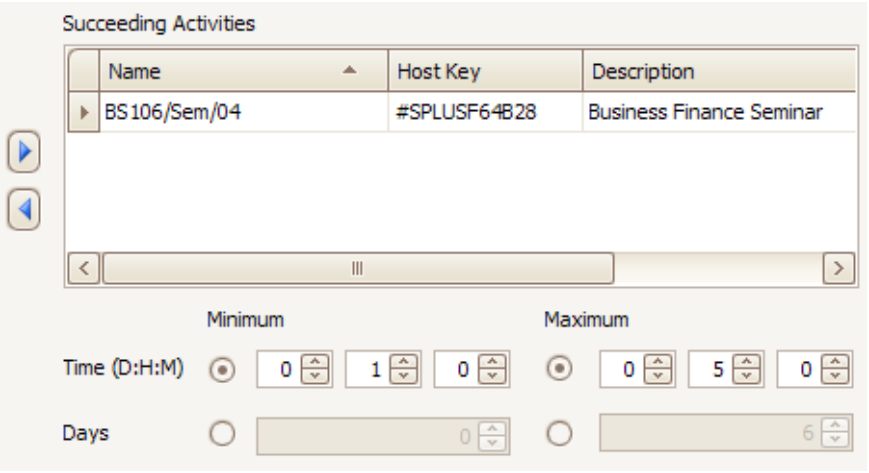


Figure 71 Specifying the gap

The user can specify the minimum and maximum gap in one of two ways. By selecting the time option, the gap can be specified precisely. Selecting one day as the gap in this context is interpreted as a precise twenty-four hours. It is important to remember that the gap is measured from the end of the preceding activity to the beginning of the succeeding activity so that a zero gap implies that one activity must immediately follow the other.

Using the days option leads to a different interpretation. A gap of one day in this context is interpreted to mean that the succeeding activity must be some time on the day following the preceding activity; there need not be a gap of a full twenty-four hours between the two.

2.3 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.

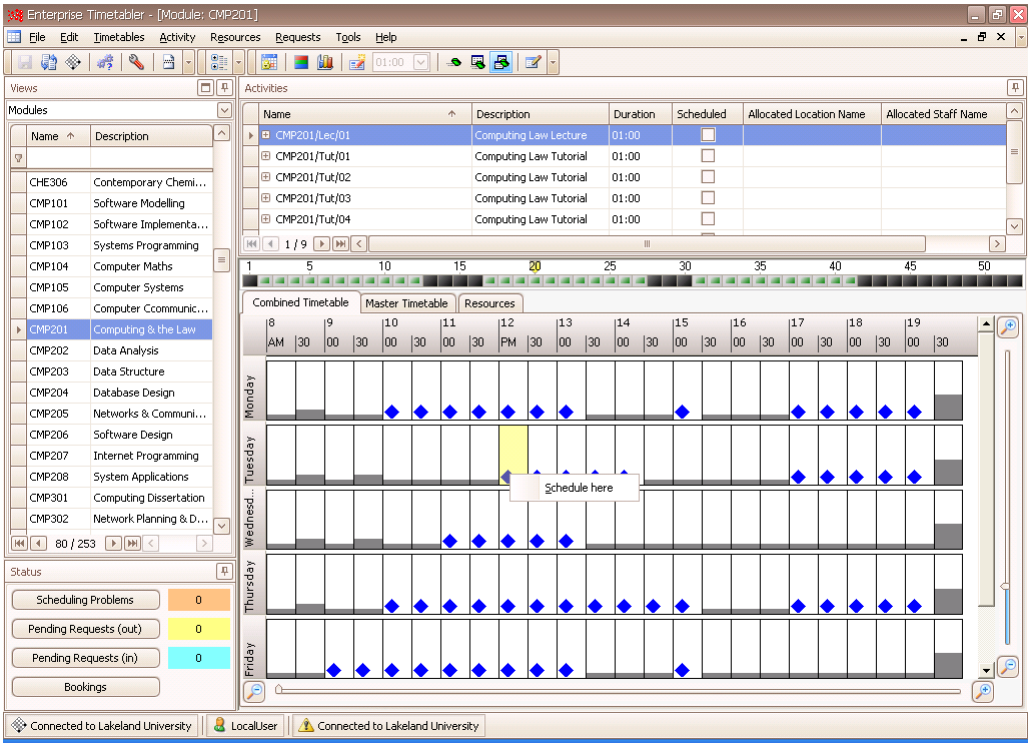


Figure 72 Scheduling an activity manually

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

2.4 Changing the scheduled weeks of an activity

At the point of being scheduled, the scheduled weeks of an activity will match its teaching week pattern which is determined by its own availability pattern as well as that of its owning module as described in section 2.1.10.

Any change to the availability pattern once the activity has been scheduled may result in a mismatch between teaching weeks (when the activity *should* be running) and scheduled weeks (when the activity *is* running).

To avoid any mismatch the user can use the **Edit Weeks** option from the activity speed menu. This will open a dialog that looks like this:

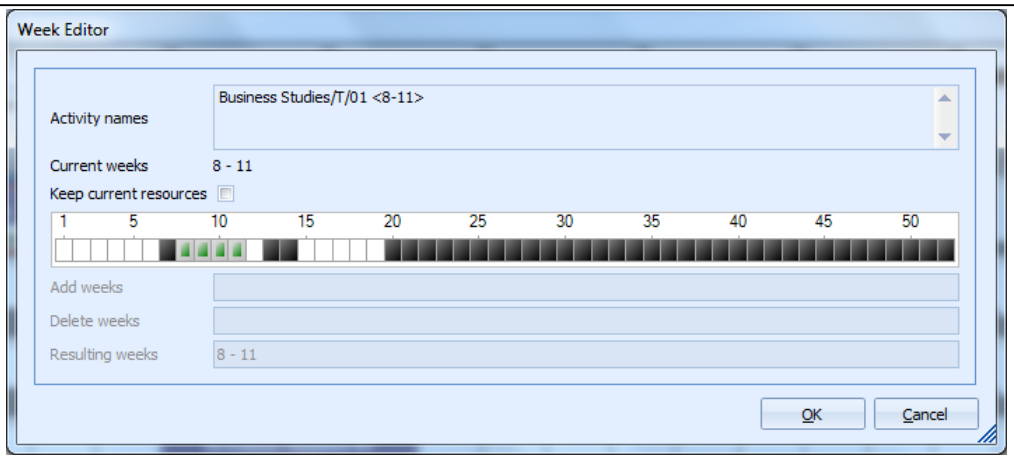


Figure 73 Weeks editor

The editor will show the name of the selected activity or activities and the weeks in which the activity is currently scheduled.

The week bar that is shown will indicate the following:

- In dark grey, weeks when the activity cannot run because of its availability or that of its module.
- In green, weeks when the activity is currently scheduled.
- In white, weeks when the activity could run.

The user can select and deselect weeks using the mouse. Selected weeks are shown in light grey and the three boxes at the bottom show which weeks will be added or removed as well as the resulting weeks of the activity if and when the user clicks OK.

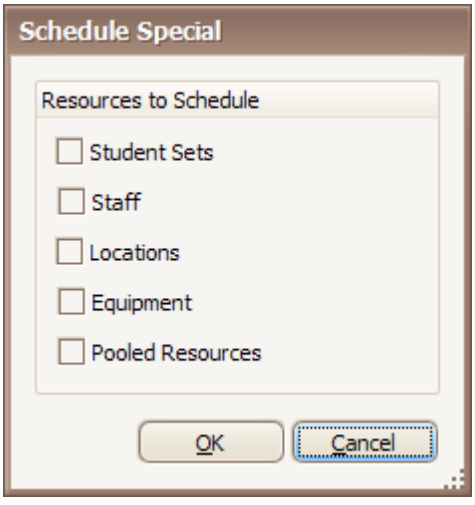
When the "Keep current resources" check box is ticked, the availability of the currently allocated resources is also considered when determining which weeks could be added without causing a problem.

When an activity is currently unscheduled, using the **Edit Weeks** option will result in the activity becoming scheduled. Remember that the user is editing the *scheduled* weeks of the activity (the weeks in which it *is* scheduled) rather than the teaching week pattern (the weeks in which it *should* be scheduled).

In the special case where an activity is a variant child and the weeks that are being added already belong to a sibling activity, the user will be prompted to remind them that adding the week(s) to one variant will remove them from another.

2.5 Schedule special

The normal schedule operation will attempt to schedule the activity at a specified day / time and with allocated resources that satisfy the activity's requirements. If the user wishes to schedule in such a way that only some of the required resources are allocated or wishes to allocate resources without changing the scheduled day / time then this can be done using the *Schedule Special* function from the Scheduling menu.



Selecting this option will open a window like this:

Figure 74 Schedule special window

The user should select (by ticking) those resources that they wish to be allocated.

If the activity is already scheduled then the scheduled day / time of the activity will remain unchanged and the selected resource type(s) will be allocated. If the activity already has the selected resource types allocated then the allocation will remain unchanged.

If the activity is unscheduled then it will be scheduled but only the selected resource type(s) will be allocated. Any resource type that is not selected will remain unallocated even though the activity has a requirement for that type of resource.

This type of scheduling may be used in the scenario where the user wishes to set the day / time of activities without reference to the availability of a specific resource type and then allocate the resources later.

2.6 Unschedule special

If the user wishes to remove resources of a particular type that have already been allocated to a scheduled activity this can be accomplished using the *Unschedule Special* function from the Scheduling menu.

The user is presented with a window similar to the *Schedule* Special window (see above) and the function leaves a scheduled activity as scheduled but unallocates resources of the type(s) that the user selects.

This function might be used in a scenario where users have already allocated resources to activities on a first come first served basis, while a timetable was under construction, but there is now a desire to achieve a more equitable allocation. The user could use unscheduled special to remove all the allocated locations, for example, and then use schedule special to allocate locations without the first come first served bias.

2.7 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 menu with options: *Create Activity* and *Create Activity (Suggested Time)*.

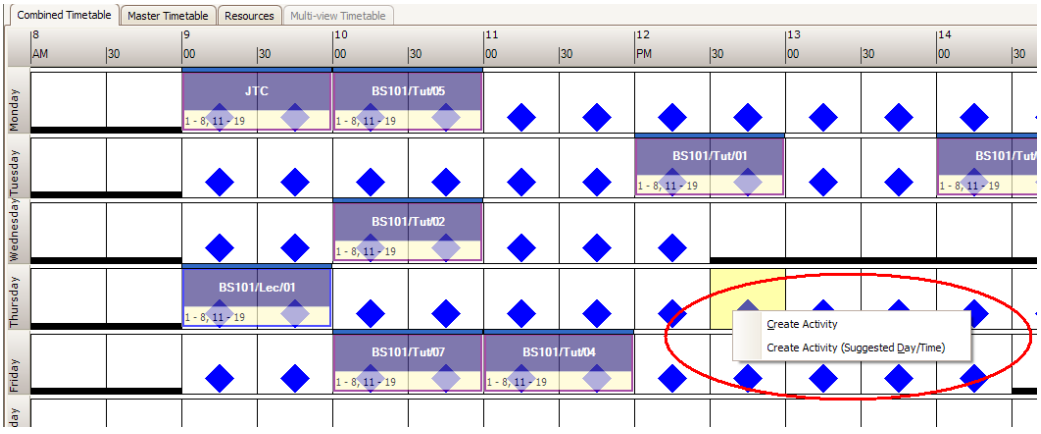


Figure 75 Creating a scheduled activity

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, scheduled at the selected point on the **Timetable** grid.

If the option “Create Activity (Suggested Time)” is selected, the effect is the same except that the day and time will be interpreted as a suggested day and time for the activity. The suggested day and time for an activity is independent of the day and time when it is actually scheduled.

The advantage of applying a suggested day and time is that it will be remembered, even if the activity is later unscheduled (at which point the scheduled day and time will be lost. It can be applied as a hard or soft constraint when scheduling activities automatically. An activity that is scheduled at a time other than its suggested day / time is deemed to have a scheduling problem..

*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 3.*

2.8 Adding and Removing Suggested Day / Time

By right clicking on an activity, either in the **Activity Spreadsheet** or in the **Timetable** grid the user can invoke a menu that allows the suggested day / time to be set or unset.

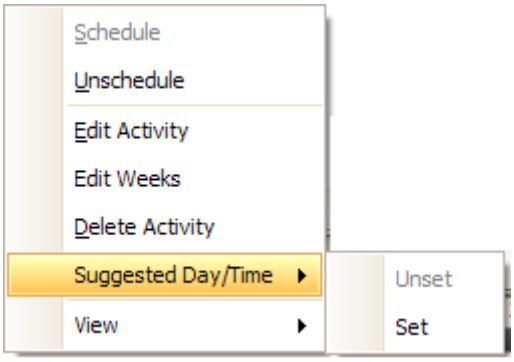


Figure 76 Setting or unsetting suggested day / time

If an activity has no suggested day / time but is scheduled then the user will have the option to *Set* the suggested day / time. The effect of selecting this option is to make the currently scheduled day / time the suggested day / time as well. Should the activity be unscheduled, the suggested day / time would then be remembered.

If an activity already has a suggested day / time the user will have the option to *Unset* the day / time. Selecting this option will leave the activity scheduled but will remove the suggested day / time so that the activity can be moved without introducing a scheduling problem.

If multiple activities are selected when the menu is invoked then it is possible that both options will be available (there may be activities both with and without suggested times among the selection). In this case, choosing *Set* or *Unset* will apply the change to all of the selected activities whether or not they currently have suggested day / time.

2.9 Creating Copies of Activities

If the user wishes to create additional activities that are similar to an activity that already exists then it may be quicker to create copies of existing activities and edit them, rather than creating new activities from scratch.

The user can control the behaviour of the copy function using the *Configure* option from the Activity | Copy

Activities menu.

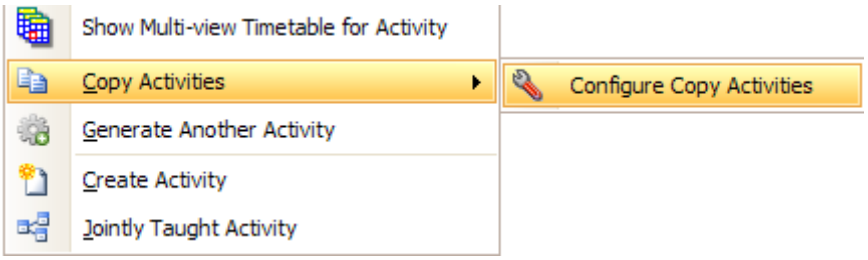


Figure 77 Configure copy activities

Selecting this option will open the Copy Configuration window as shown below:

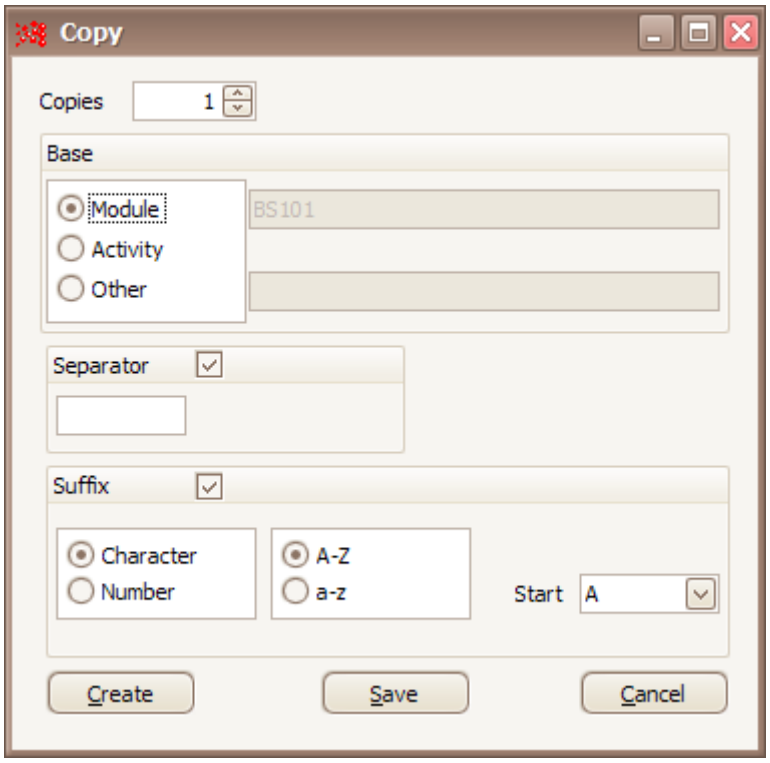


Figure 78 Copy configuration window

The user can control the following behaviour for the copy function:

Number of copies

The number set here dictates the number of copies of the selected activity(ies) that will be made when the copy function is invoked.

Base of the name of each copy

The name of each of the copies will have a stem that can be formed from either the name of the module to which the original activity belongs, the name of the original activity itself or some other text that the user enters.

Separator

If the user ticks the *Separator* checkbox then they can specify a separator that will be used between the stem of the name and the suffix.

Suffix

The user can decide how the suffix of each copy is to be constructed. There is a choice of using an alphabetical character or a number.

If the user chooses a character-based suffix then they can decide whether the character should be upper or lower case and define the starting character (used for the first copy – additional copies will increment from

this point).
If the user selects a numerical suffix they can decide how many digits should be used as well as the starting number (used for the first copy).

If the user clicks the *Create* button then the specified number of copies will be created using the naming rules defined as a one off operation; the values will not be remembered.

If the user clicks the *Save* button then the specified number of copies and the naming rules will be remembered as the users preferred method for the copy operation; any time the user invokes the copy function from then onwards, the saved values will be used to determine how the copy function will behave. The *Cancel* button will close the window without making copies or saving changes.

2.9.1 Copying a Scheduled Activity to Another Time

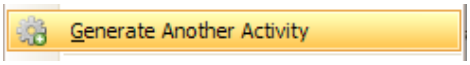
The user can make a single copy of an already scheduled activity by holding down the *Shift* key while performing a drag and drop operation on the activity. The newly created activity will be identical to the original except that it will have a different scheduled day /time as a result of the drag operation and its name will have the word "(copy)" appended to the name of the original activity.

2.10 Generating Activities From Templates

Where activities have been automatically generated from an activity template using Enterprise Course Planner, it may be preferable to generate an additional activity from the same template, rather than creating a copy of an activity which will not be associated with a template.

The concept of a template is that it describes the required activities of a module from the perspective of an individual student on that module. Enterprise Course Planner uses the template to determine how many times an activity must be repeated in order to accommodate all the students on a module.

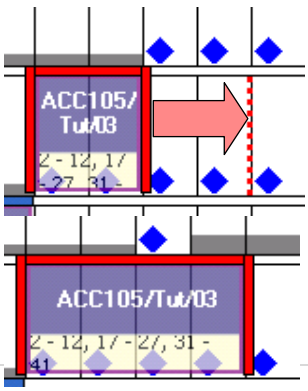
Each student must attend only one of the activities that are generated from each template so if a new activity is being added because student numbers are greater than expected or because it was impossible to schedule clash-free activities for some students then it is appropriate to generate another activity from the same template. On the other hand, if the additional activity is an extra tutorial session for some students who must attend this *in addition* to another activity generated from the template then you should use the copy function instead; otherwise it will prove impossible to allocate the students to both activities.

The user can generate an additional activity from the template to which the selected activity belongs by selecting the option from the Edit 

menu or the context menu that appears when right clicking on an activity.

2.11 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.



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.

Figure 79 Extending duration

2.12 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.

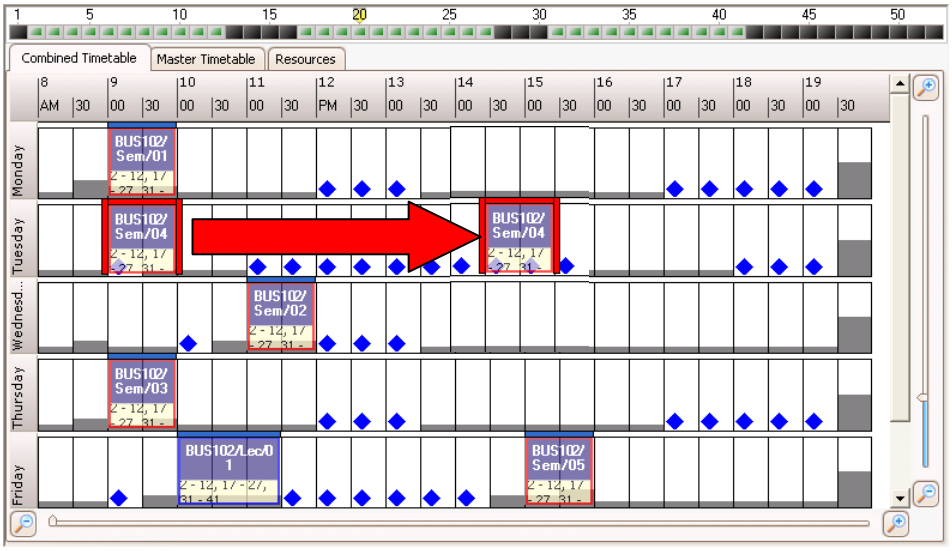
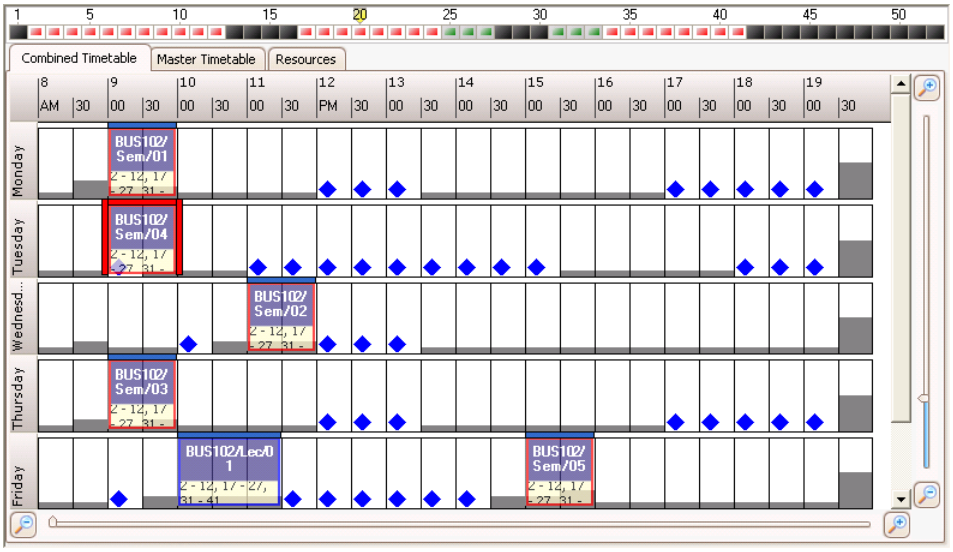


Figure 80 Using click and drag to reschedule

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.**

2.13 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 81 Timetable grid in variant mode

When the user enters **Variant Mode** the weeks of the activity will be deselected and the user will be asked to select the weeks they wish to edit. By clicking and dragging across the scheduled weeks of the activity in the **Week Pattern** bar the user can select the weeks of the activity which are to be scheduled in a different timeslot (these weeks will change from red to green).

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. 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.

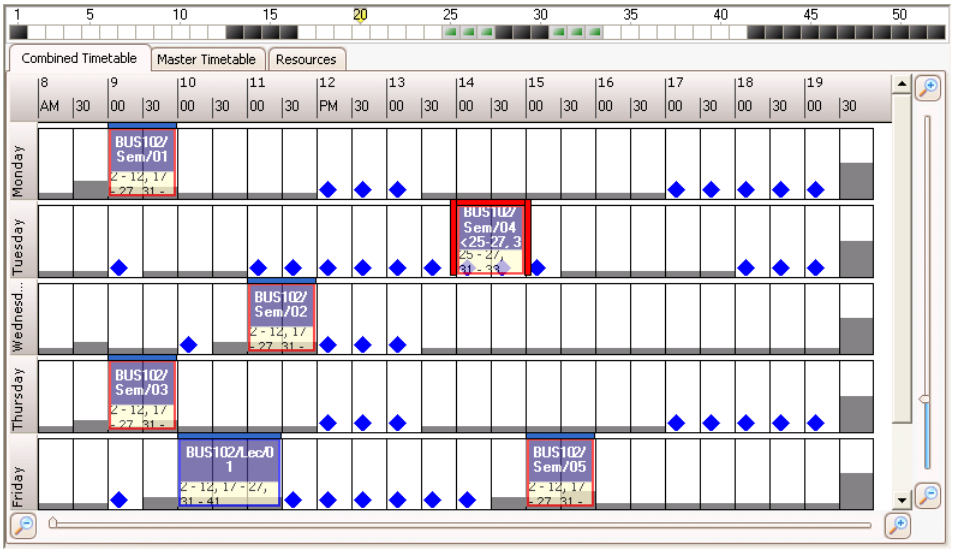
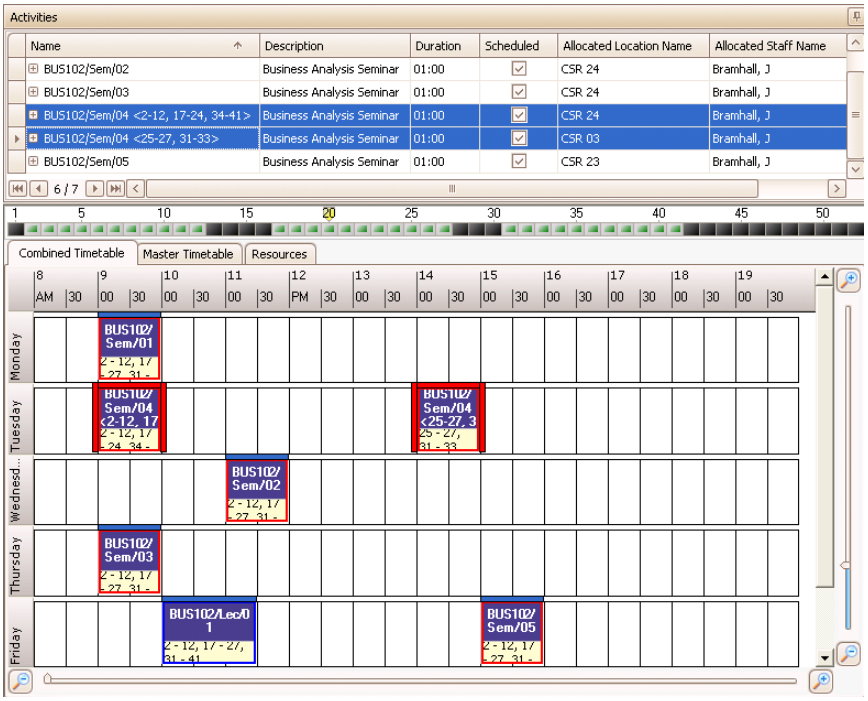


Figure 82 Activity variant after rescheduling



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 83 Timetable grid showing two variant activities

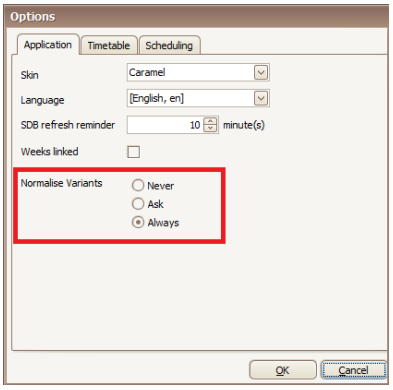
This process has an effect in Syllabus Plus as well as in Enterprise Timetabler. When the original activity is effectively split into two activities each with different week patterns, the original activity in Splus becomes a "parent" activity, is unscheduled, and is "hidden". The two new Activities become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

2.13.1 Further variation

It is possible to create further variants by selecting and editing in variant mode, an activity that is already a variant child. Note that in this case the existing variant child will have weeks removed and a new variant child *that shares the same parent* will be created. In each case there will only be a single parent activity with multiple variant children.

2.13.2 Recombination of variants

It is possible that the drag and drop operation performed on an existing variant will result in two variants of the same parent becoming identical. For example, suppose that one week of a multi-week activity was moved to a different time and, later, another week was moved to the same time. The two weeks that had changed could now be represented by a single variant.



The user can control how this potential for normalisation of variants is handled using the options available in the **Application** tab of the **Options** window, available from the **Tools** menu.

Figure 84 - Options for normalisation of variants

If the user selects "Never" then variants, once created will never be combined with another variant, even though two variants turn out to be identical. If the user selects "Ask" then in the case where two variants become identical this will be detected and the user will be asked whether or not to combine them to create a single variant. If the user selects "Always", then variants that become identical will be combined to create a single variant without further input from the user.

2.13.3 Merging of variants

A right click on an activity that is a variant child gives the user the option to **Merge Variant Weeks**. The dialog shown below allows the user to select which of the siblings to add the weeks of the selected variant to. Alternatively, the user can delete the activity completely. This will have the effect of removing the variant child and removing its weeks from the variant parent.

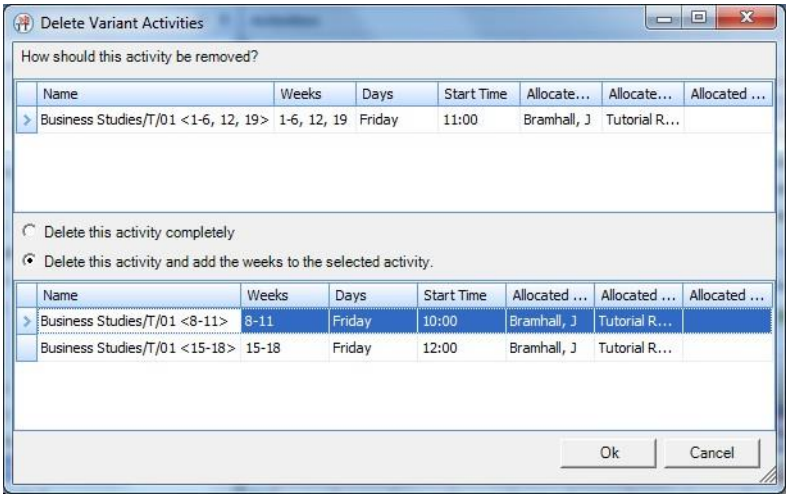


Figure 85 - Options for merging of variants

The same choice is presented to the user if they use the delete option against an activity, not realising that it is a variant child. In this case, it is assumed that the user wishes to delete the activity completely so that option is selected by default.

2.13.4 Deletion of variants

If the user is aware that the selected activity is a variant child and has already decided that they wish to remove the weeks completely, this can be done using the **Delete Variant** option. Choosing this option will skip the dialog and remove the weeks of the selected variant immediately.
In the special case where all but one of the activity variants belonging to the same parent are deleted then the user has the option to either remove the weeks of the deleted variants completely or to merge their weeks with the one remaining variant. In either case the remaining variant will become a normal activity (it is not logical to have a single variant child) and the variant parent will be deleted.

In the special case where all the activity variants belonging to the same parent are deleted then the user has the option to delete the activities (including the variant parent) completely or to delete all of the variant children and reinstate the parent activity as a normal activity.

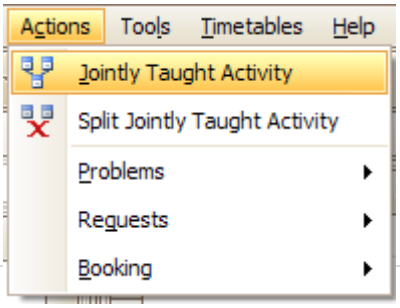
2.14 Jointly-Taught Activities

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.

A jointly-taught activity can be created either by selecting all the activities the user wishes to join or by selecting a primary activity and then selecting other activities to join to it.

2.14.1 Creating a Jointly-Taught Activity From a Primary Activity

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 **Actions** drop-down menu, select *Jointly Taught Activity*.

This selection opens the **Jointly Taught Activity** window. The method used to construct a jointly taught activity from its parents can be defined by the user in the *Options* tab of the window

Figure 86 Activity menu

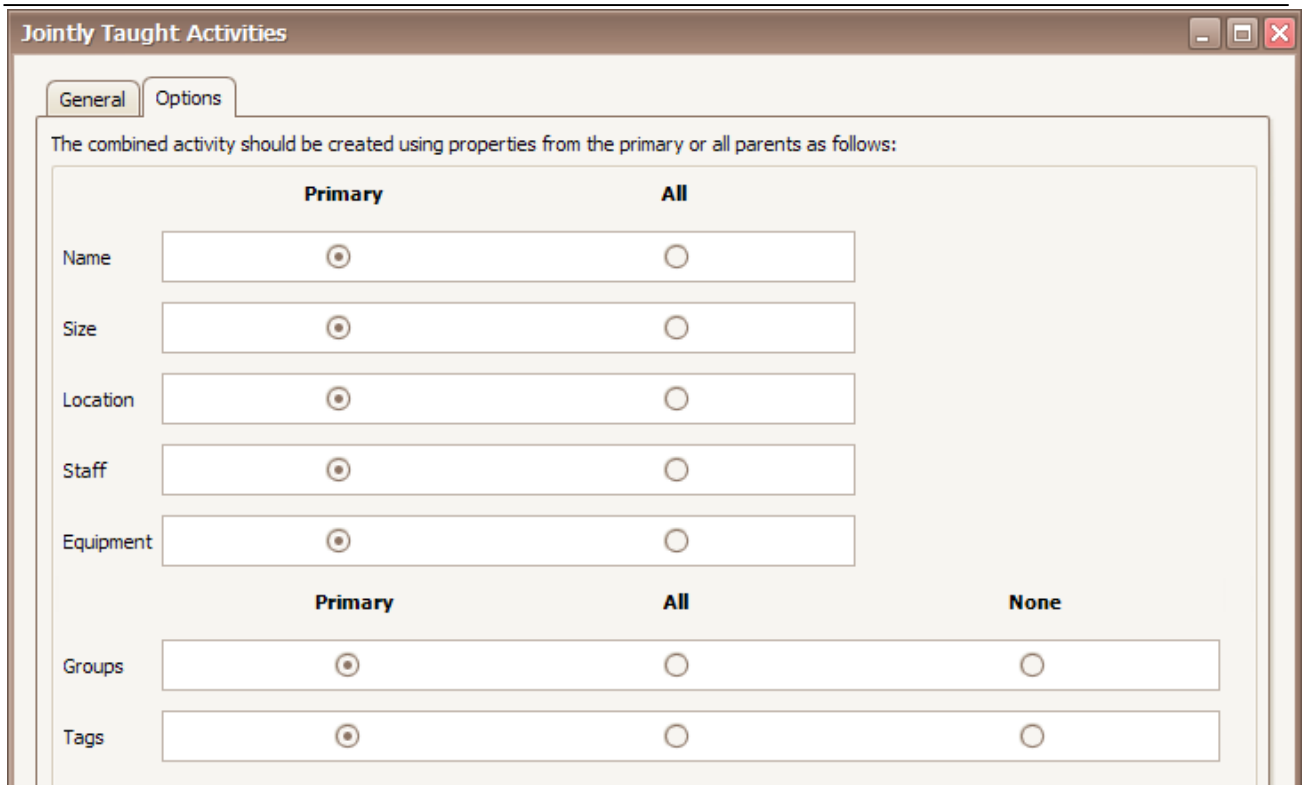


Figure 87 Options tab

The various properties of the jointly-taught child activity can be inherited either solely from the Primary Parent (as defined by the user) or by combining the properties of all of the parents. The *Activity Name* using this approach (building from a Primary Parent) will currently be that of the *Primary Activity*.

The user can determine whether the jointly-taught child activity will inherit tags and group membership from the primary parent, all the parents, or will not be associated with tags or groups.

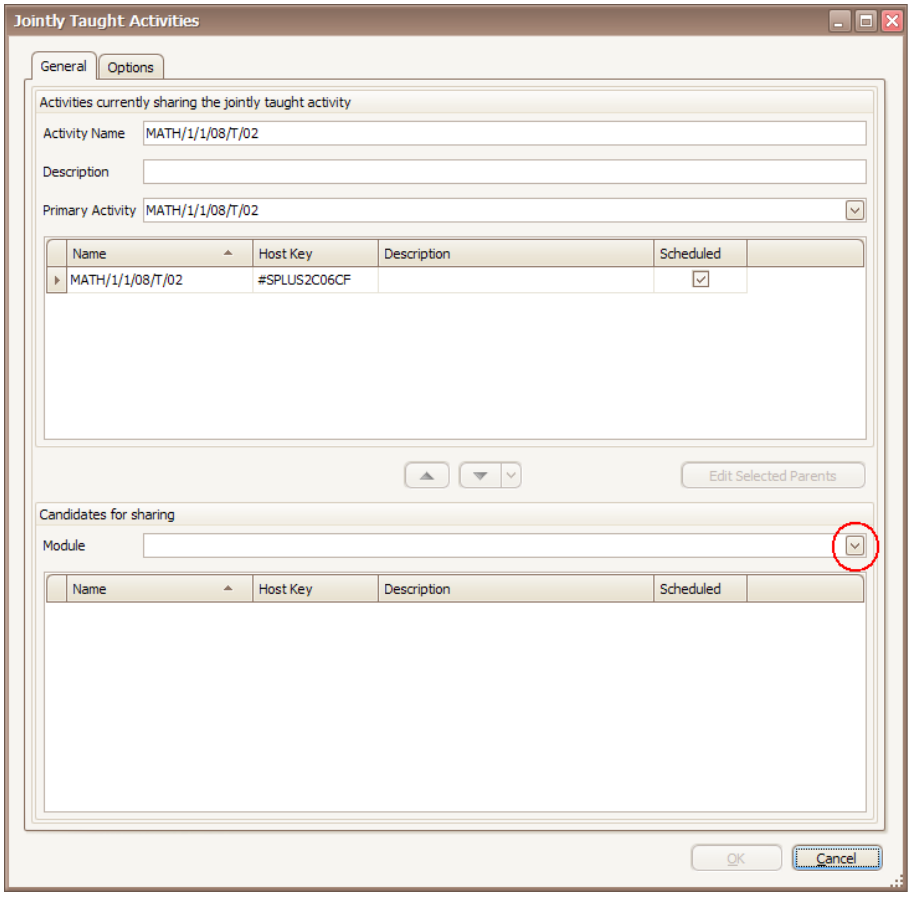
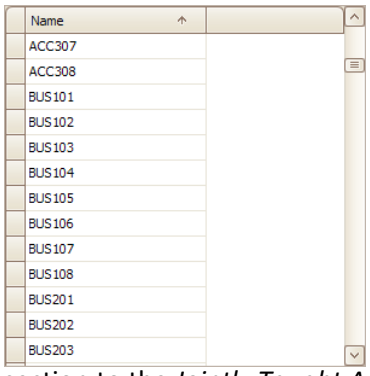


Figure 88 Jointly Taught Activities window

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



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 89 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 manually if desired.

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:

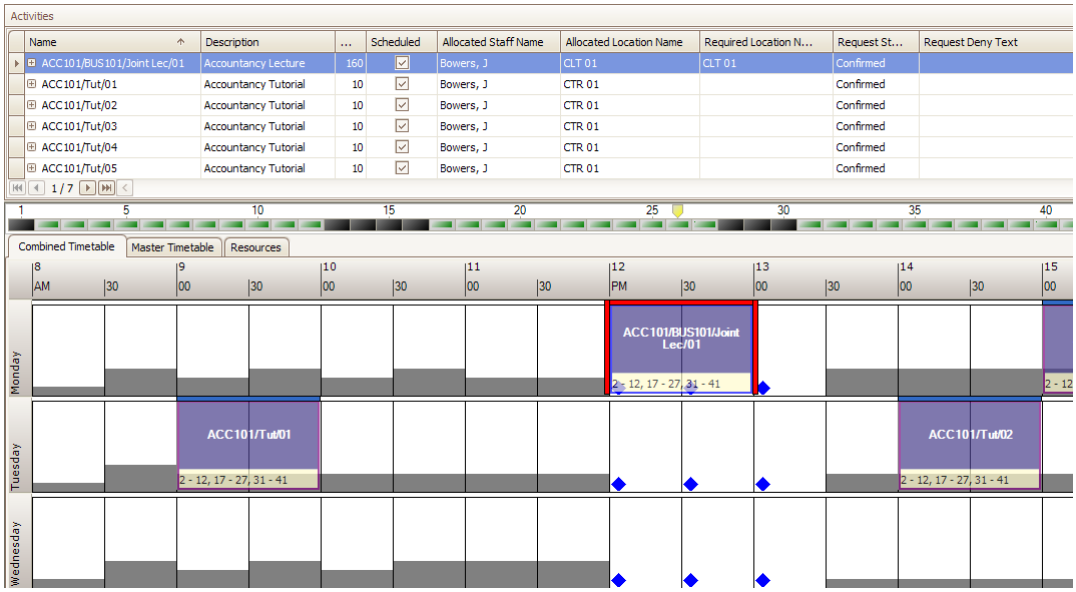


Figure 90 Jointly taught child activity

If the user chooses to inherit size from all of the parent activities then 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.

2.14.2 Creating a Jointly-Taught Activity From a Number of Selected Activities

An alternative approach is to create a timetable view (perhaps by selecting multiple modules from the object list) that allow the user to see all of the activities that should be jointly taught.

The activities can all be selected by holding down the Ctrl key while clicking on multiple activities.

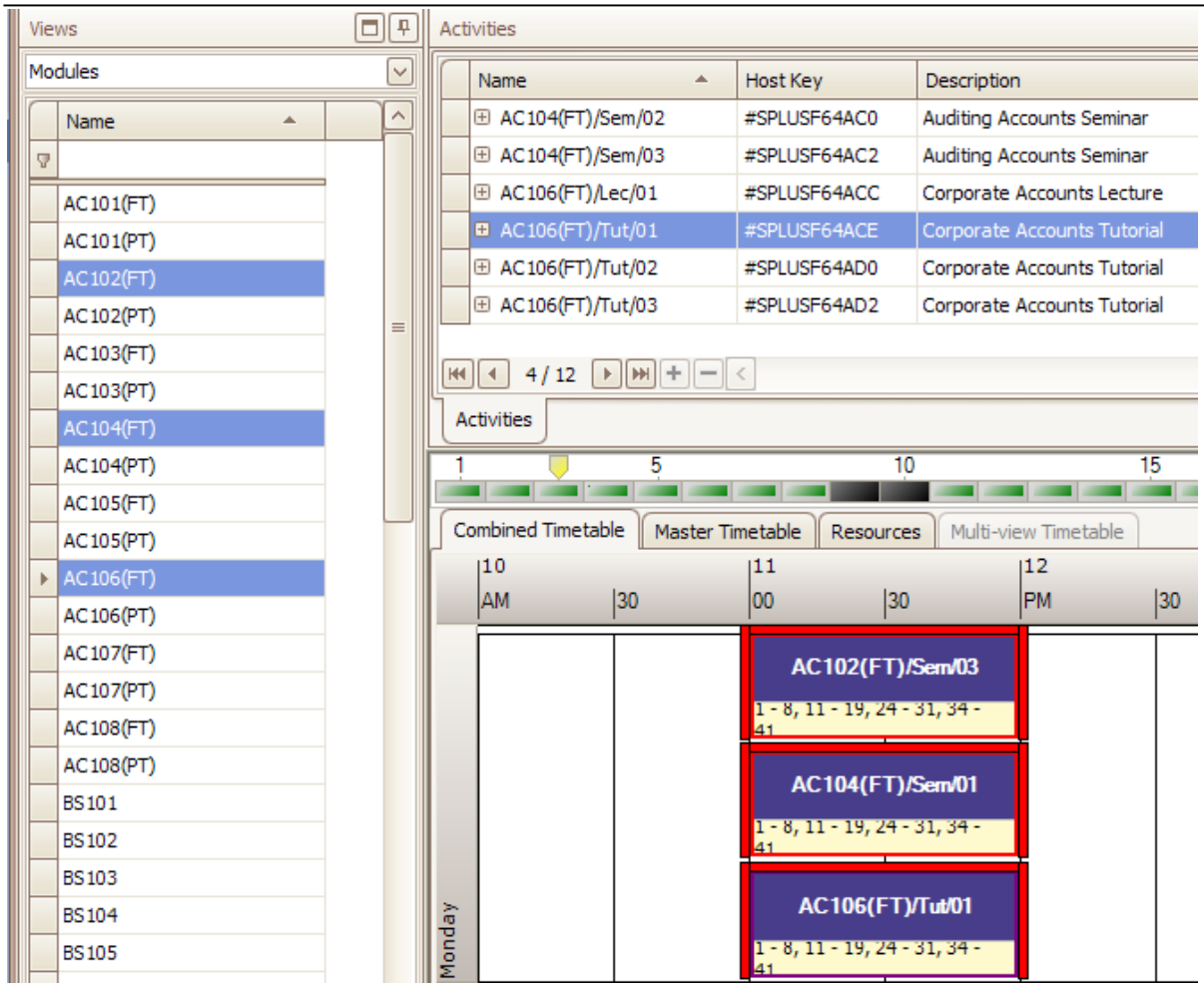


Figure 91 Multiple activities selected

Selecting the Jointly-Taught Activities option from the **Actions** menu while in this state will open the window with all the selected activities ready to be joined. The user should select which of the activities will be primary and the construction rules in the options tab will then be followed to create a jointly taught child when the user clicks OK.

2.14.3 Editing a Jointly-Taught Activity

The Jointly-Taught Activities option remains selectable from the menu when an existing jointly taught activity is selected. Selecting the option opens the Jointly-Taught Activities window and allows the user to edit the activity, either adding further parent activities to the relationship or removing existing parents from it.

The removal of a parent activity does not delete either the parent or the child. The parent activity that is removed from the relationship is treated in one of three ways, dictated by the user's choice. The button used to remove a parent from the relationship  has a drop-down button that allows the user to select from the following actions:

Reschedule (Original Time): After the parent is removed from the relationship it will be rescheduled at the day / time that it was scheduled before it was made part of the jointly-taught relationship. **Reschedule (Current Time)**: After the parent is removed from the relationship it will be rescheduled at the day / time that the jointly taught child is currently scheduled.

Leave Unscheduled: After the parent is removed from the relationship it will remain unscheduled.

In all cases, the child activity remains unchanged by the removal of a parent.

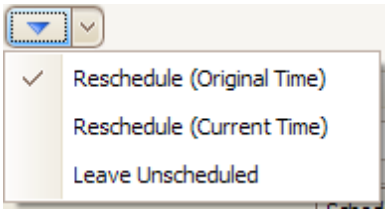


Figure 92 Rescheduling options

If the jointly-taught child has only two remaining parents then it will not be possible to remove either of those parents since this would amount to a deletion of the jointly-taught child, for which see the next section.

2.14.4 Deleting a Jointly-Taught Activity

If the user wishes to delete the jointly taught child, removing all of its parents from the relationship, this can be done using the option *Split Jointly Taught Activity* from the **Actions** menu. The effect of this option is to delete the jointly taught child activity, leaving behind the parents that were joined in the relationship. The parents will be treated according to the user's selection as described in the previous section.

2.14.5 Editing parents

If the user wishes to edit details of parent activities after they have been joined, this can be done by selecting the activities to be edited and clicking the *Edit Parent Activities* button. This will open an *Activity Editor* window. Changes made here will be applied to all of the selected activities when the user clicks OK.

2.15 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.

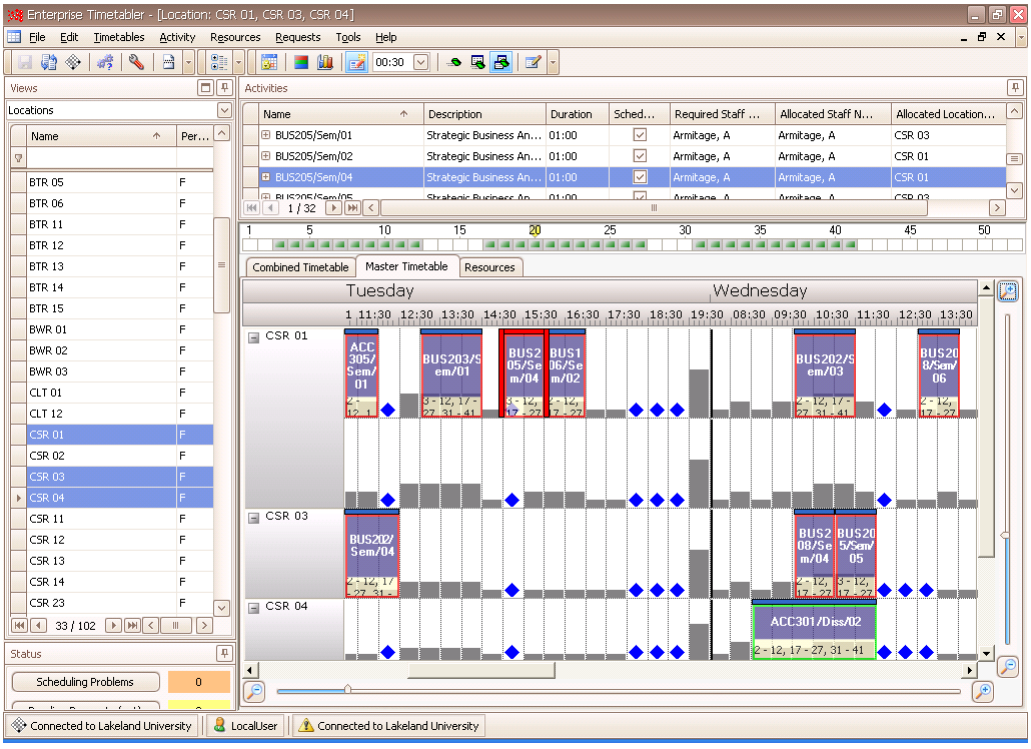


Figure 93 Master Timetable

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*.

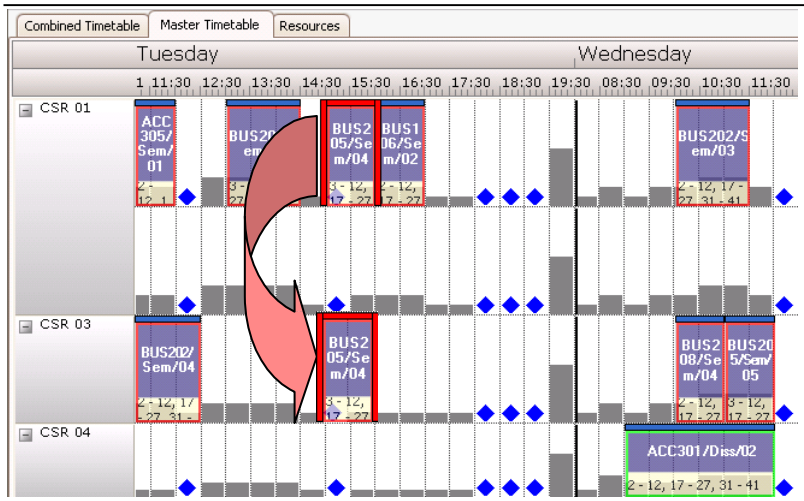


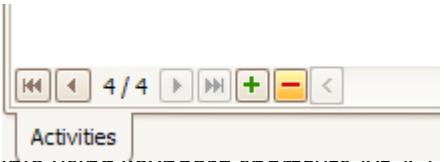
Figure 94 Drag and drop to change resource allocation

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.

2.16 Deletion of Activities

An activity or activities can be deleted by selecting the activity(ies) and pressing the "Delete" key or clicking the delete button beneath the **Activity Spreadsheet**.



Alternatively, the delete option is available on the menu (also accessible using keyboard shortcuts Alt-A | D) or the context menu as shown below.

Figure 95 Delete button

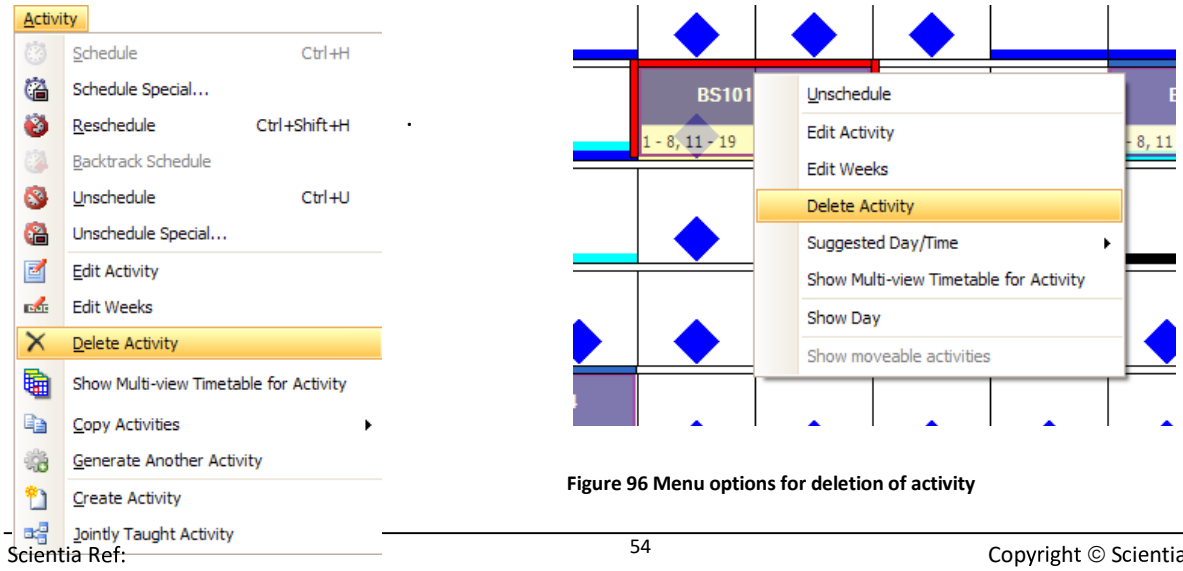


Figure 96 Menu options for deletion of activity

In any case, the deletion of one or more activities will be preceded by a warning message:

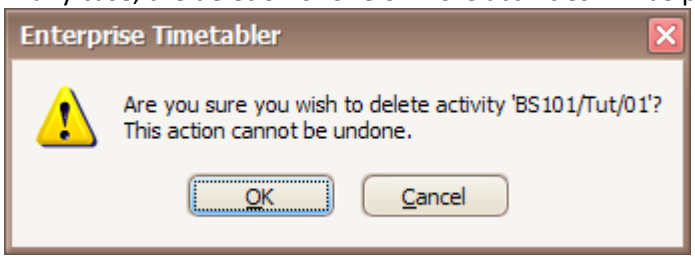


Figure 97 Warning on activity deletion

Clicking OK will delete the activity. Clicking cancel will leave the activity intact.

3 Using the Resource Editor

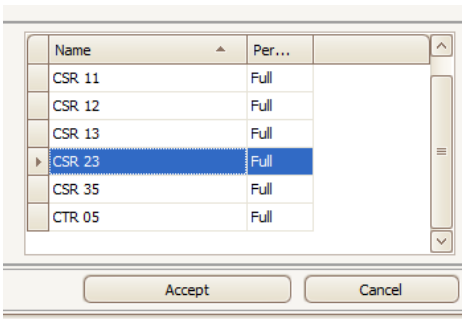
The *Combined* and *Master* timetable tabs both allow the editing of activities using drag and drop operations, but with limited control over resource allocation. The *Combined* timetable will show a blue diamond indicating that the selected activity can be moved to a different timeslot and, provided 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 *Resources Editor*.

Figure 98 Resource tab

3.1 Changing allocated resources or time

When the tab is opened, there are two columns displayed. The left hand column shows the requirements of the activity while the right hand column shows the currently allocated day / time / resources or, in other words, how the requirements are currently being satisfied. For example, in Figure 98, above, the activity has a requirement for 1 location that must be a tutorial room in the Coniston building. This is being satisfied by the location CSR 23.



To search for an alternative solution (another way to satisfy the requirements) the user must click on the appropriate search button. To find an alternative location that satisfies the requirements (in the example this means it must be a tutorial room in the Coniston building) and is available at the currently scheduled time of the activity, the user must click on the search button at the top right of the location row. The appearance of the window will change to show a list of viable alternatives, with the currently allocated location selected in the list, as shown below.

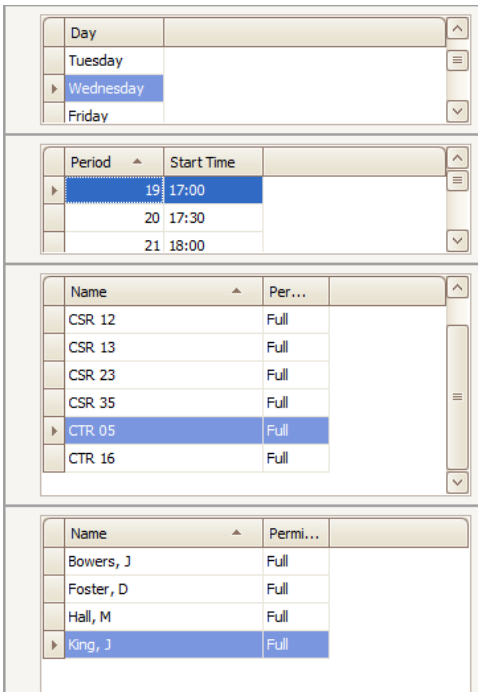


Figure 99 - Alternative locations search results

The user can move the activity to a different location by selecting from the alternatives presented in the list. Clicking on the Accept button will allocate the selected location. Clicking on the Cancel button will cause the allocated resource to revert to whatever it was prior to the search. Either action will close the search results list and cause the resource tab to revert to its original state.

In the case where there is no solution (the search returns a blank list) the user may decide to allow other elements of the solution to flex. For example, the user may be prepared to move the activity to a different time (on the same day) in order to find an alternative location. This can be done using the search button for the times section of the resource tab. If a solution on a different day is acceptable, then the search button on the day section may be used. Each additional search button clicked allows greater flexibility in looking for a solution.

The user may determine at the outset that they wish to examine all possible solutions to the scheduling requirement. In this case the user must click the Search All button at the top right of the right hand column. This will change the right hand column to show available resources as shown below.

Figure 100 Available resources in resource tab

3.1.1 Changing resources at the current time

The column will show the currently allocated day / time and resources as selected. The resource lists will show (not selected) other resources that both satisfy the requirements as specified in the left hand column and are available at the current day / time.

Selecting a resource and clicking the Accept button will change the allocation of the activity (the resource being used to satisfy the requirement) and will return the resource tab to its original state, displaying the current allocation in the right hand column.

In the case of an unscheduled activity the search function will look for resources that are available at the suggested day / time of the activity if it has one.

3.1.2 Changing the time using the current resources

On the other hand, the user may wish to keep the currently allocated resources but find an alternative time when the activity can be scheduled. The day and time lists will display (not selected) other days / times when the currently selected resources are available. As soon as the user selects a different day, the list of times will update to show only the times when the currently allocated resources are available on that day. If the user selects a different time, the days list will update to show only days when the currently allocated resources are available at that time.

3.1.3 Flexing time and resources

The user may be willing to allow both day and time to flex in order to find a solution using alternative resources to those currently allocated. This can be done by using the lists interactively. If, for example, the user were to deselect the time, the resource lists would update to show resources available at any time on the selected day and the day list would show all days on which there was at least one time when the activity could be scheduled. If the user were to deselect the day as well then the resource lists would show all resources available for at least one day / time.

Selecting a different day / time will constrain the resource lists by that day / time. Selecting different

resources will constrain the days / times to those when the selected resource is available. To find a solution, therefore, **the user should begin by selecting the most important criterion in the solution**. If it is most important that the activity take place at a different day / time, select the day / time first and the resource choice will be limited by that selection. If it most important that a particular resource is used, select the resource first so that the day / time choice is limited by the availability of that resource.

Using the lists in combination, the user may experiment until they find an agreeable solution. On clicking Accept, the current selection of day / time / resources is construed as the users preferred solution and the resource tab returns to its original mode of displaying the currently allocated day / time / resources.

If the user wishes to return to the state the activity was in prior to entering search mode, they can do so by clicking the Cancel button.

3.2 Changing Requirements

In its initial state the resource tab shows a summary of the requirements for each of the day / time / resources. To see more details the user can selectively expand individual sections of the requirements column using the "+" that appears next to the summary. Alternatively, the Show All Requirements button will expand the requirements for all sections.

3.2.1 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. So that the scheduling engine makes a sensible choice of resource, the user will wish to describe the number and type of resources required for the activity. The method for doing this is described below.

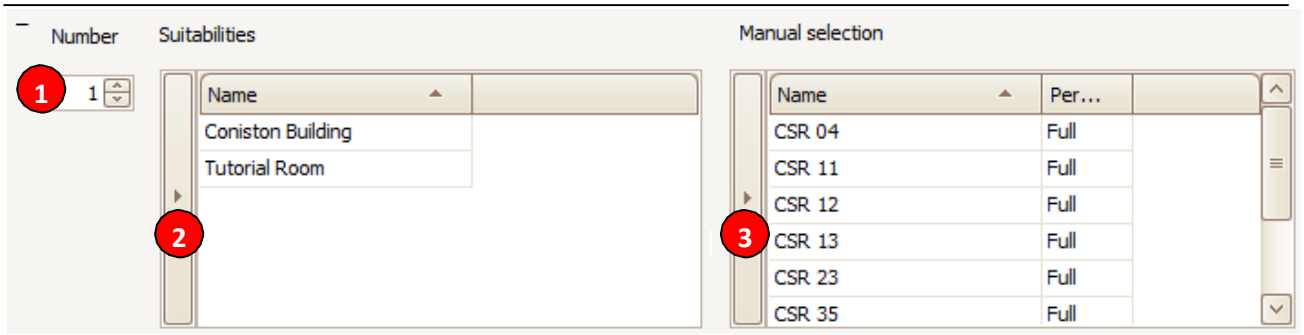


Figure 101 Flexible requirement

1 The user may specify the number of resources required by the activity using the spin button control.

2 Clicking on this button will open a window which allows suitabilities to be added or removed from the required list using the squirter buttons as shown below. A suitability is a property of a resource that makes it suitable for a particular activity. For example, a location may be suitable by virtue of its geography (being on a particular campus or in a particular building), its type (being a lecture theatre or a practical laboratory), or its features and fixed equipment (having tiered seating, blackout blinds and a data projector).

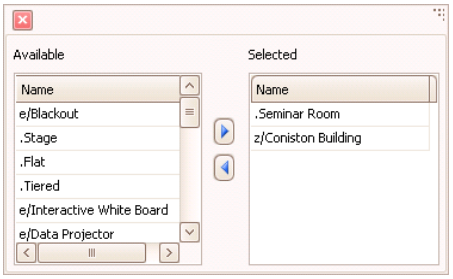


Figure 102 Editing suitabilities

Addition of extra properties will narrow the list of suitable resources to those that have all of the selected properties. The list of resources that have all the required suitabilities (the suitable resources) will be displayed on the right hand side of the requirements section.

3 Clicking on this button will open the list of suitable resources for editing. The user can manually exclude resources if desired. For example, the requirement may be for a tutorial room in the Coniston building but not CSR 23. When the user creates a custom list of suitable resources in this way, the selected suitabilities are removed since they are no longer an accurate representation of the requirements of the activity.

3.2.2 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 of suitable resources. If one or more items are selected then the spin button control that indicates the number of resources required will be greyed out and set to the number of resources selected from the list.

To change the resource requirement the user should click the Change Requirement button at the bottom of the requirements section. 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* and a pop up warning message will appear to inform the user that a new problem has been created.

3.2.3 Changing requirements for a scheduled activity

In the case where an activity is already scheduled, changing the requirement has the potential for creating a resource mismatch where the required resource is different from the allocated resource. ET will always attempt to resolve such a mismatch by adjusting the allocation to match the requirement.

In some circumstances making this adjustment might cause the activity to have a scheduling problem. For example, if the user changes the requirement for locations to a particular location that happens to be in use for some other activity at the time when the activity is scheduled, changing the allocated location would cause a double booking problem.

Consider as an example an activity that has a wildcard requirement for a location and already has an allocated location that satisfies the requirements, like this:

Figure 103 Location requirements satisfied

The search button can be used to find locations that are both suitable and available at the time when the activity is scheduled. Picking from the results of the search will never create a scheduling problem. In the case where the user wishes to force the allocation of a specific resource, regardless of its availability, however, they might choose to change the *requirement* to a preset.

If the location that is selected is different from the one already allocated there will be a resource mismatch which the scheduling engine will attempt to resolve by allocating the required location. In the case where the selected location is unavailable for some reason, the user will see a warning message detailing the problem(s) that would be caused by resolving the mismatch and allocating the required resource.

Remembering that the requirements for activities can be changed for multiple activities in one operation, there is the potential for a single change to resource requirement, applied to multiple activities, to cause multiple problems. For example, if a user changes the location requirement for three activities so that they all require the same location, that may cause no problem for one activity, while causing a double booking for the second and an unavailability problem for the third.

The warning message therefore splits the activities affected by the change of resource into three categories as shown below:

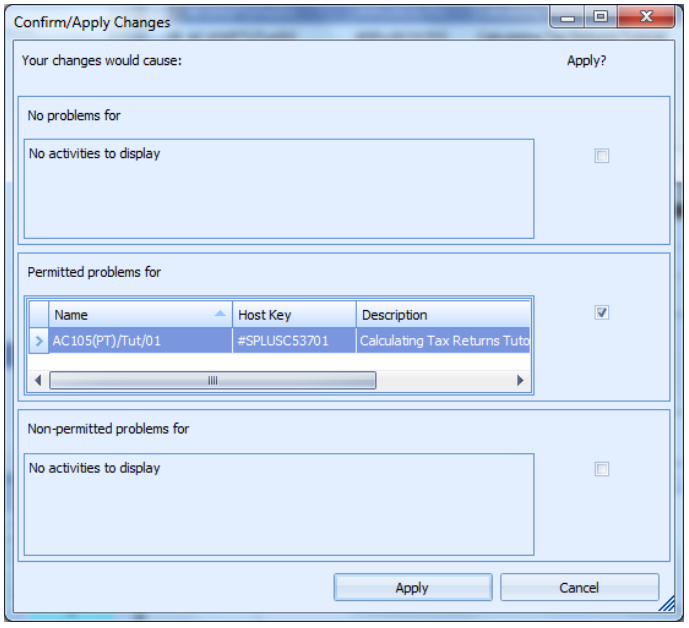


Figure 104 Confirm changes to requirements

The first list shows activities where the changed requirement can be applied (resolving any resulting

mismatch) without causing any scheduling problems.

The second list shows activities where the changed requirement, if applied, will cause a scheduling problem that would be allowed if the user was working in constraint breaking mode; in other words, constraints that are “Usually” applied in the **Tools | Constraints** window.

The third list shows activities where the changed requirement, if applied, will cause a scheduling problem that would not be allowed even if the user was working in constraint breaking mode, in other words, constraints that are “Always” applied in the **Tools | Constraints** window.

The user can choose to apply the changed requirements selectively to activities in the first two categories but not to activities in the third category. This prevents users that do not have permission to break constraints from circumventing the restriction by changing resource requirements such that constraints are broken indirectly.

3.2.4 Fixing the day and time

Just as resources can be made a preset requirement for an activity, so can day and / or time. This can be done in either of two ways. In the resource tab the user may tick the box related to a specific day and may select a specific time from the list of times in the requirements column. Alternatively, in the case where an activity is already scheduled, the user may right click on the activity, either in the timetable grid or in the activity spreadsheet, and select the option Suggested day / time | Set. This action will set the suggested day and time to match the current day and time.

3.2.5 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.

If the change made results in two variants becoming identical then they may be recombined into a single variant depending on the option chosen by the user as described in section 2.13.1.

3.2.6 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 constrain the search. The days will 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**.

3.2.7 Multiple Selection of Activities

Where more than one activity is selected the search column of the resource editor become inactive. It is not possible 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.

3.3 Editing Student Sets against Activities

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

option.

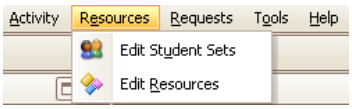


Figure 105 Edit student sets

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).

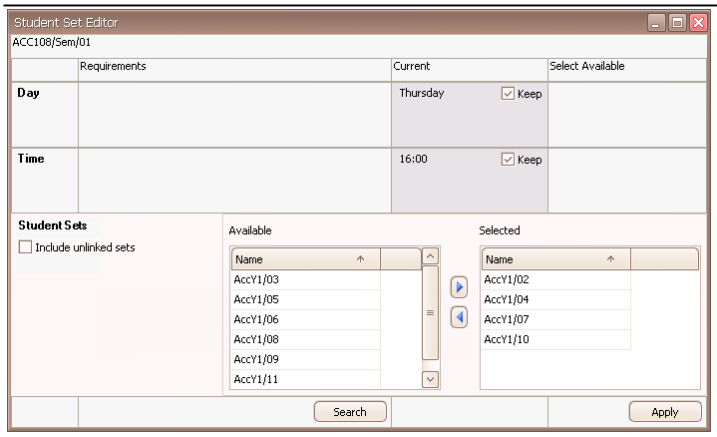


Figure 106 Student set editor

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 Apply 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.

4 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.

4.1 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.

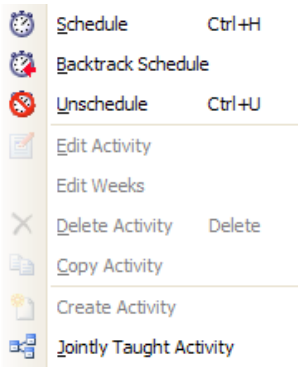
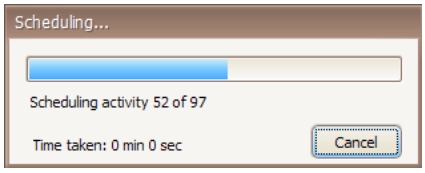


Figure 107 Activity menu

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 108 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 8.1

Figure 109 Schedule and unscheduled buttons

4.2 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:

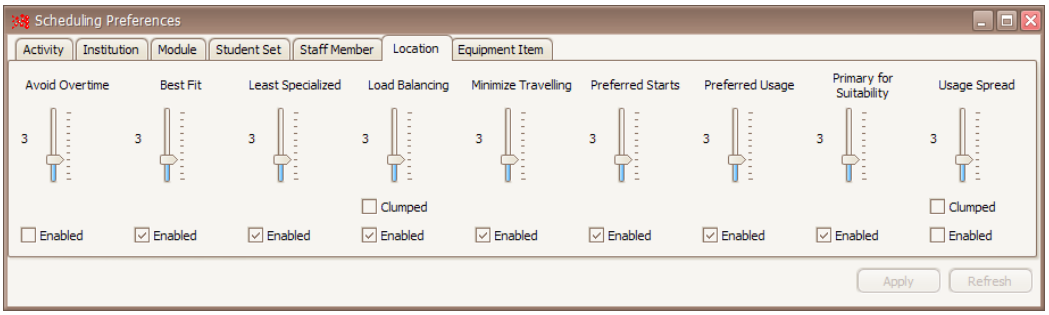


Figure 110 Scheduling preferences

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.

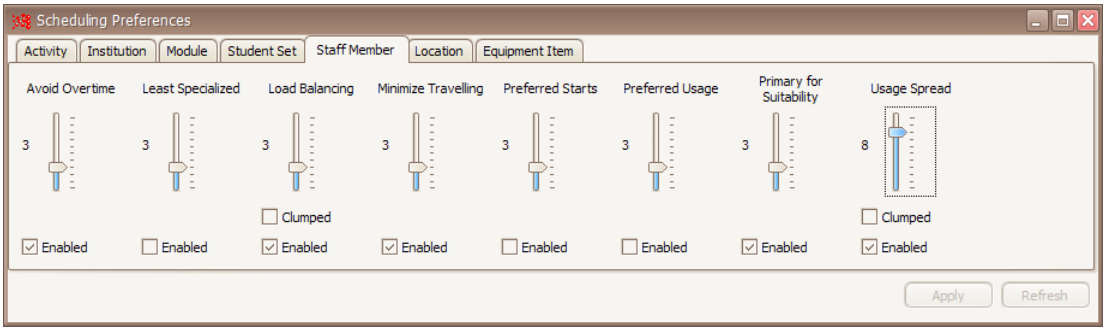


Figure 111 High priority for spreading staff activities

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

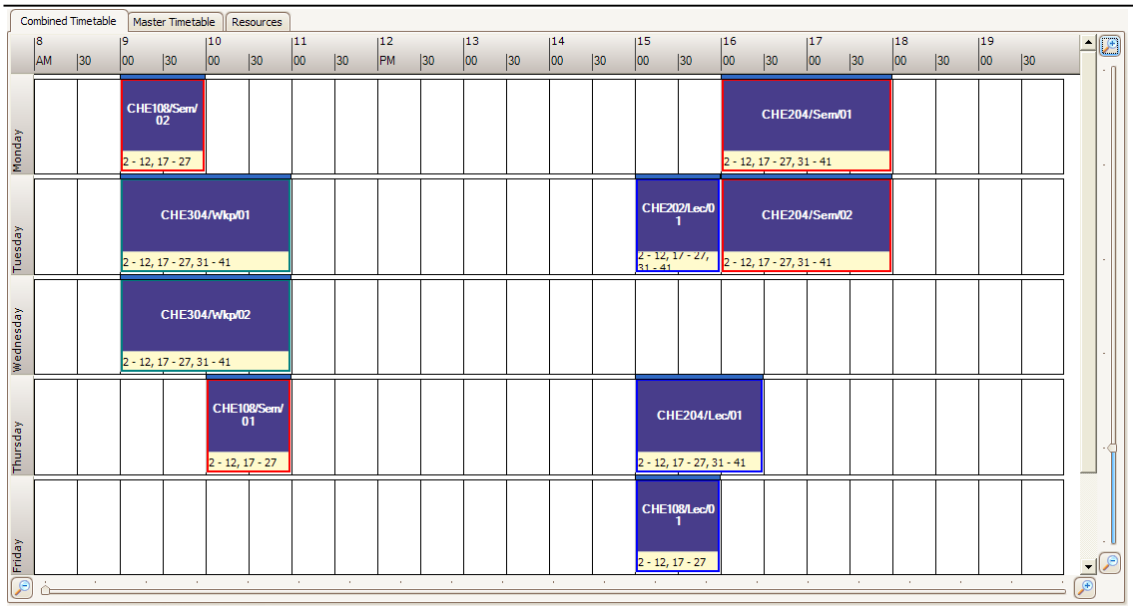


Figure 112 Result of spreading staff activities

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.

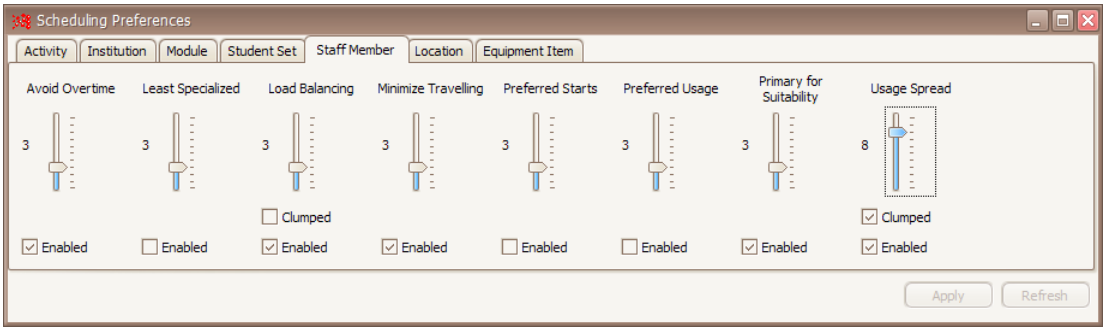


Figure 113 High priority for clumping staff activities

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

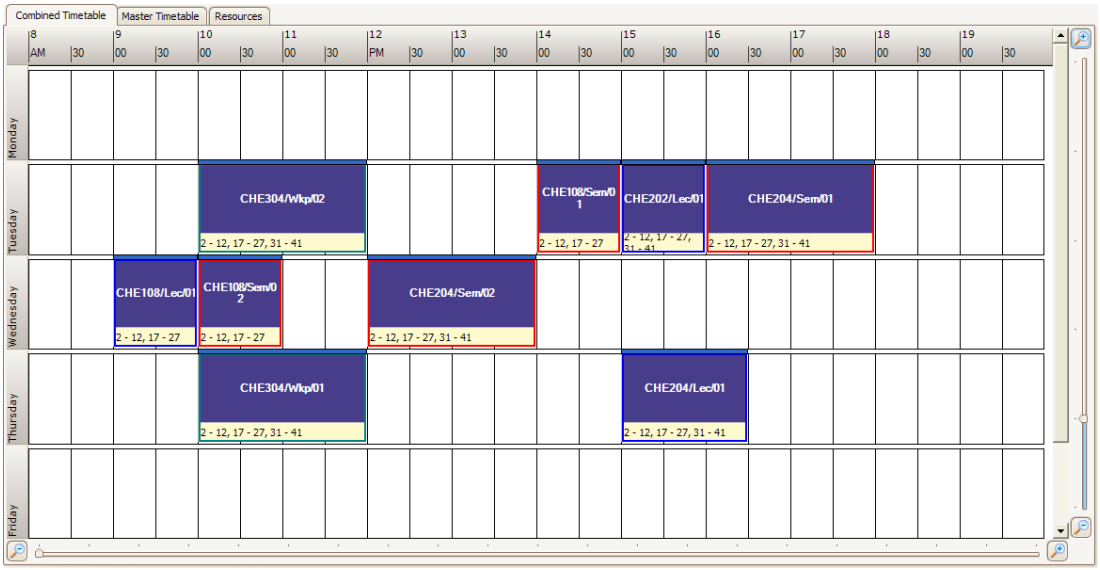


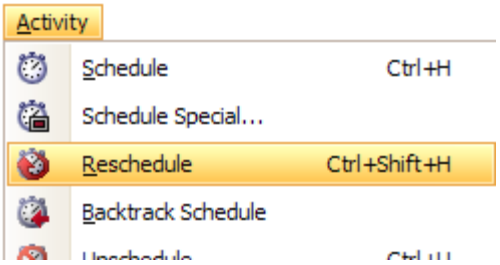
Figure 114 Result of clumping staff activities

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.

4.3 Rescheduling

Having applied changed scheduling preferences the user may wish to see the effect of these on already scheduled activities. The user can select an activity, a group of activities, an object or a group of objects and apply the *Reschedule* option. This is available from the *Activity* menu or can be invoked using the Ctrl+Shift+H keyboard combination.



The effect of choosing the *Reschedule* is to take each of

Figure 115 Reschedule option

the selected activities (or the activities of the selected objects) and, one at a time, unschedule and reschedule them.

4.4 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.

4.5 Scheduling Options

While performing scheduling operations (manually or automatically) the user can control various aspects of the behaviour of the scheduling engine. These parameters are changed in the *Scheduling* tab of the *Options* window, accessed from the **Tools** menu.

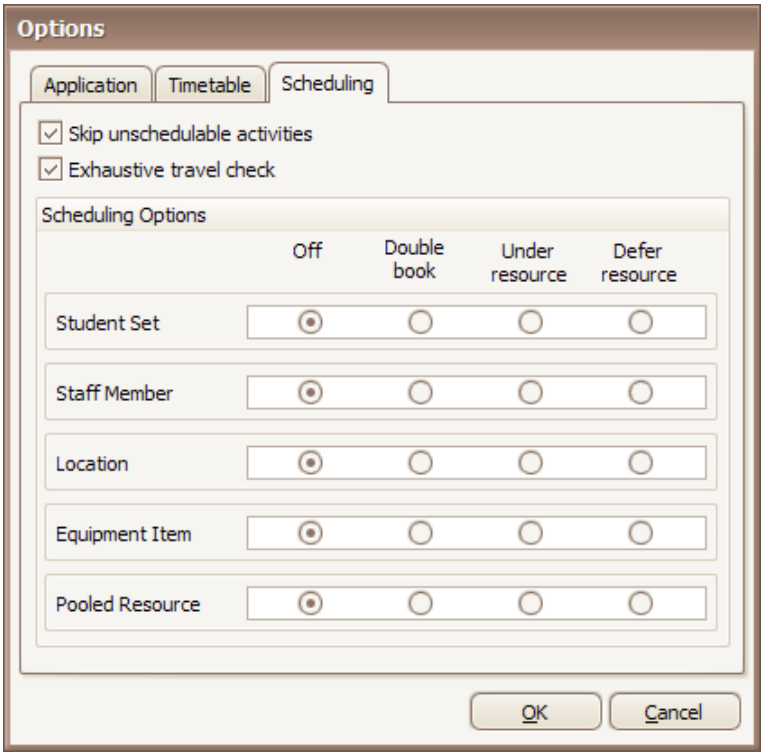


Figure 116 Scheduling tab of options window

4.5.1 Skip unschedulable activities

When the user presents a set of activities to be scheduled automatically, the scheduling engine will behave differently depending on this option. With the option set, if the scheduling engine encounters an activity that cannot be scheduled, it will skip this activity and continue with the remaining activities. With the option unset, scheduling will stop as soon as such an activity is encountered.

4.5.2 Exhaustive travel check

When assessing the schedulability of an activity, the scheduling engine will check that the required student sets / staff are able to travel to the available locations before indicating that the activity can be scheduled (with a blue diamond).

In the case of an activity with a requirement for one member of staff from many suitable staff and a requirement for one location from many locations, the number of permutations to be checked will be very large and checking will introduce a noticeable delay when such an activity is selected.

If the user prefers not to conduct the exhaustive check of permutations they may unset the option. The consequence will be that the scheduling engine will return blue diamonds more rapidly but may indicate that an activity can be scheduled at a slot that is not viable because staff or students have insufficient travel time to get to the location(s) available at that slot.

4.5.3 Double book

With the double book option selected against any of the resource types, the scheduling engine will double book that resource type *if necessary* to schedule the activity. Enabling this option for locations, for example, would enable two users to schedule activities with a preset requirement for the same location at the same time, creating a double booking problem, rather than the scheduling engine refusing to schedule one of the activities.

4.5.4 Under resource

If the user selects the *Under Resource* option, the scheduling engine will handle a potential conflict

differently. Two activities that both require the same resource can now be scheduled concurrently but, instead of double booking the resource, one of the activities with be scheduled with an under resourcing problem. The engine recognises that the resource is a requirement that has not been satisfied.

4.5.5 Defer resource

Choosing the option to *Defer Resource* makes the scheduling engine ignore the requirements for resources of the selected type. This option might be selected if, for example, scheduling of days / times and locations is undertaken first with locations being allocated in a second pass. Deferring the Location resource type would allow the scheduling engine to schedule activities without reference to the requirements for Location.

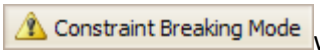
5 Constraint breaking

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.

When constraints are broken in ET, they are broken in the underlying image. This means that if the user switches to using the Syllabus Plus interface they will find that the same constraints are being broken.

5.1 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 

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.

5.2 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:

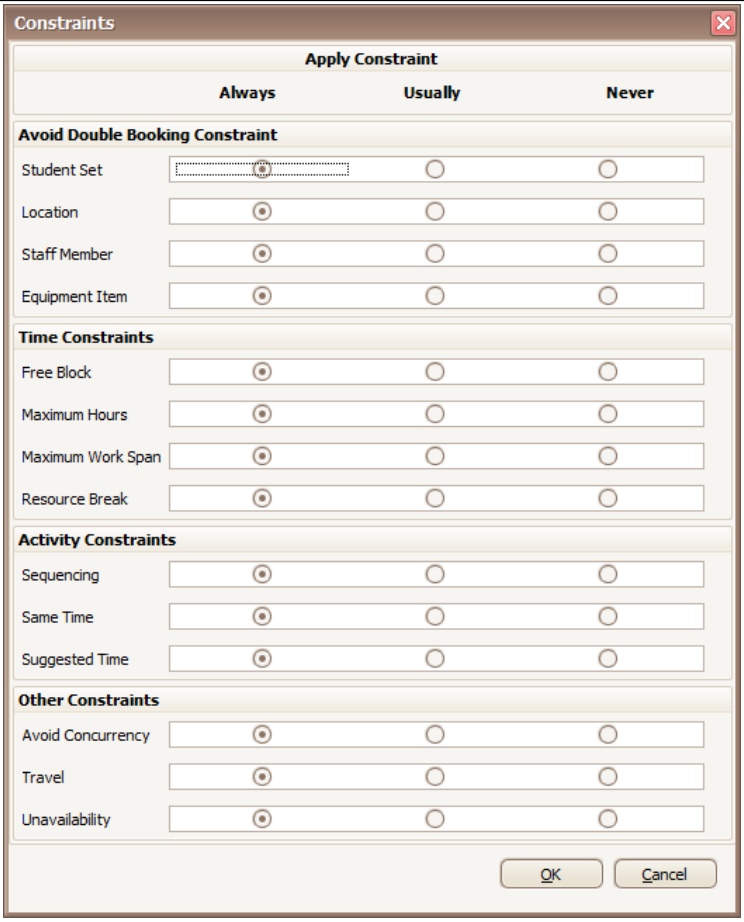


Figure 117 Constraints

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”.

5.2.1 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.

5.2.2 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.

5.2.3 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 recommended 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.

5.3 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.

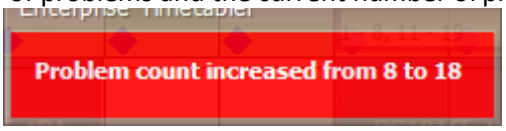


Figure 118 Problem warning

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.

5.4 Objects with problems

Some problem types are associated with a specific object. When a group of activities, all requiring the same member of staff, is scheduled in such a way that the member of staff is working more hours in a day than is permitted, ET will detect that a Maximum Hours constraint is being violated. The problem does not belong to any one of the activities; it is the combination of the way the activities are scheduled that causes the problem and it belongs to the member of staff.

In order to see which objects have problems and what type of problems they have, add the Problems column to the object view as shown below:

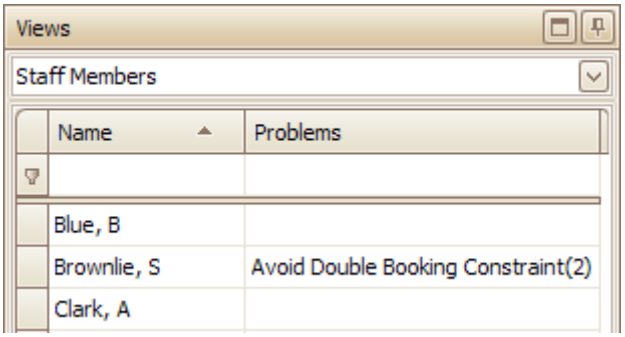


Figure 119 Object view showing problems

The problems column will show a delimited list of the problem types affecting the object and, in brackets, the number of problems of each type.

6 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

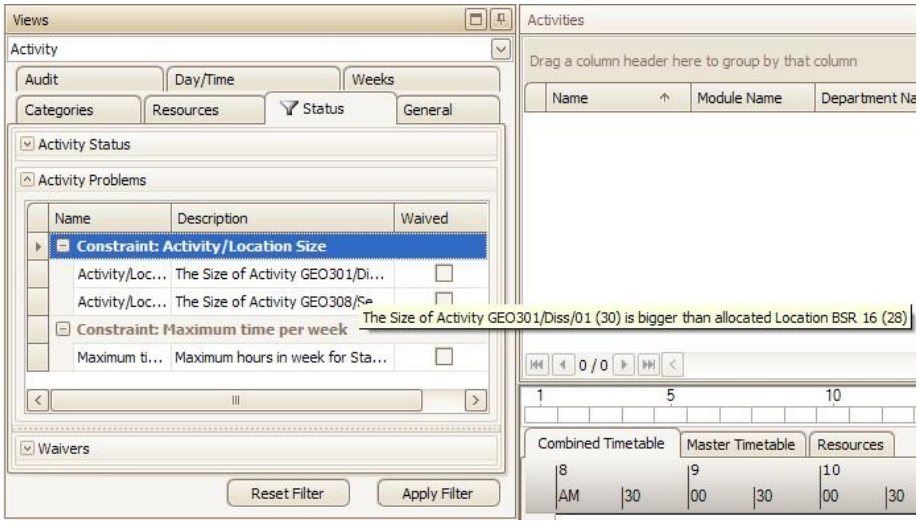
first few weeks. Moreover, a staff member may agree to work a few hours in excess of what is dictated by their contract over a short period in exchange for time off later in the year.

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.

6.1 Finding & Resolving Problems

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

Clicking on the



Problems / Waived 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 120 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**.

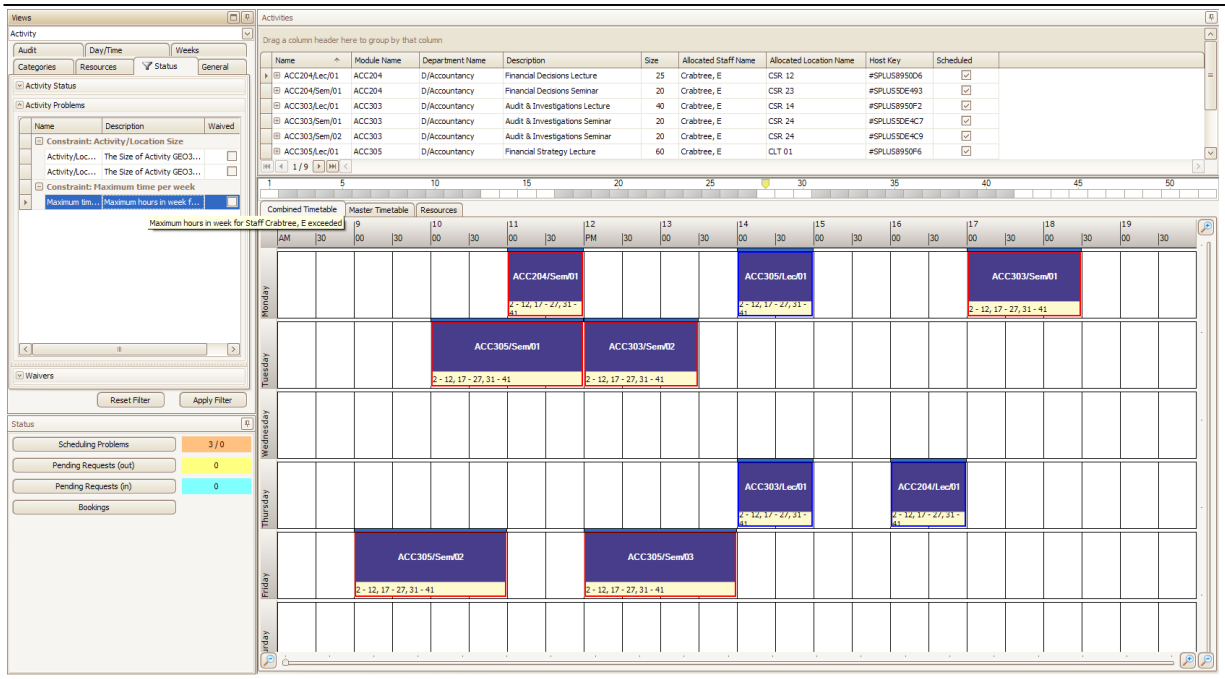


Figure 121 Timetable showing activities associated with a problem

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.

6.2 Printing a problem list

There may be times when it is useful to have a hard copy of the list of scheduling problems. This can be obtained using the "Print" button from the bottom left of the problems filter as shown below:

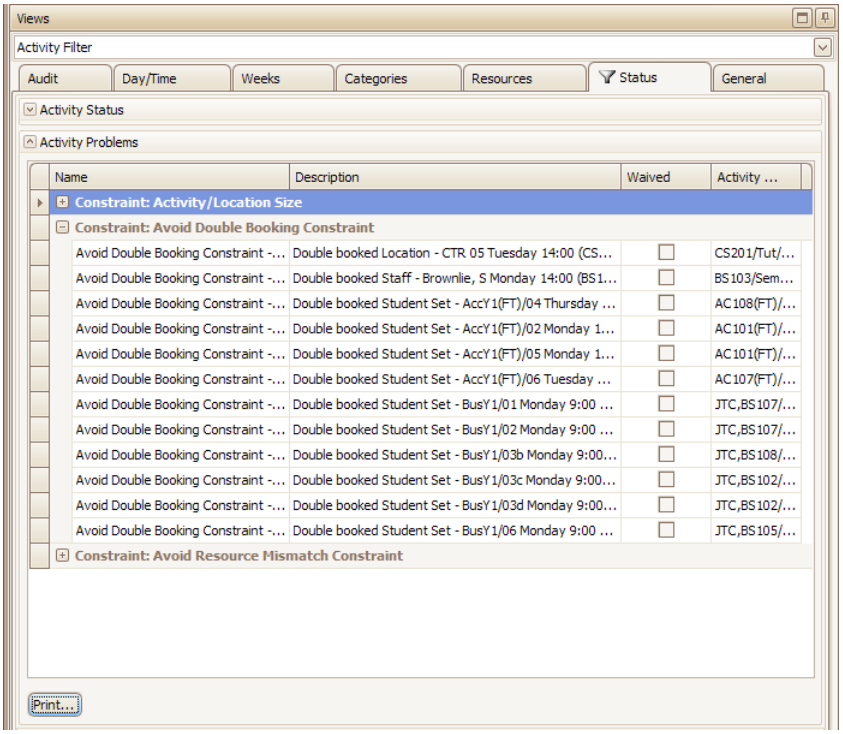
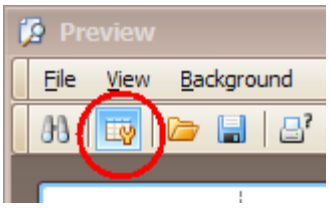


Figure 122 Problems filter - print button



This action will open a print preview window with configuration options that the user can use to control the final printed version. In order to control which problems are included in the printout the user can click the “Customise” button on the toolbar:

Figure 123 Print customise button

Clicking the button will open the Print Options window where the user can determine whether to include headers, footers grid lines etc:

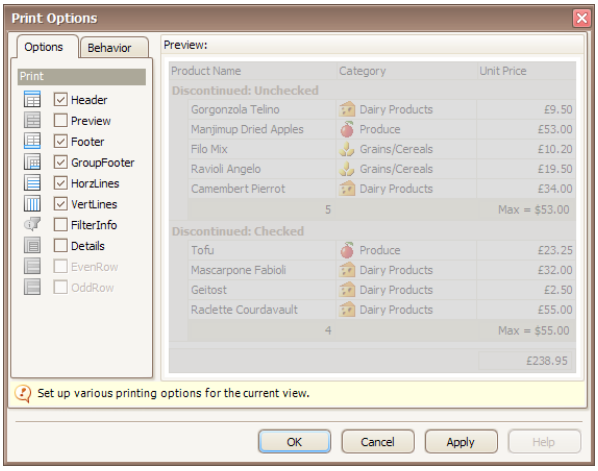
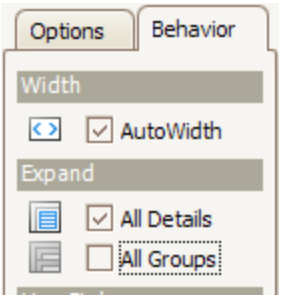


Figure 124 Print options window



Selecting the *Behaviour* tab will allow the user to decide which rows of data are included in the printout. Scheduling problems are grouped by problem type and the problem window itself gives the user the option to expand or collapse each group.

Selecting *All Groups* under the *Expand* section of the tab will expand all the groups in the printout whether or not they are expanded in the problems filter.

Figure 125 Print options behaviour

When *All Groups* is not selected then only those groups that were expanded by the user in the problems filter will be expanded in the printout.

6.3 Waiving Scheduling Problem

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.

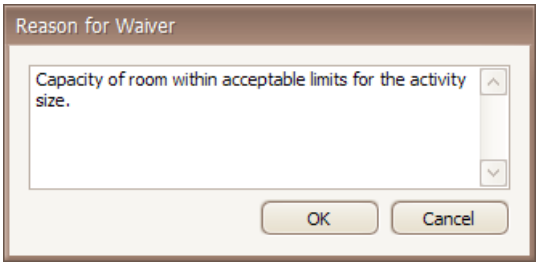


Figure 126 Reason for waiver

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**.

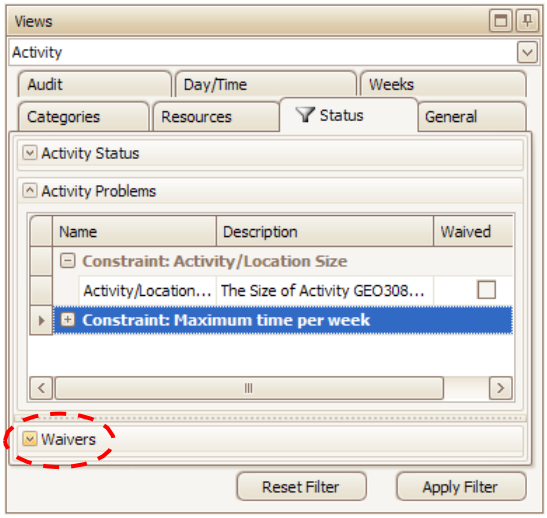


Figure 127 Waivers button

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

Problems that have been waived will be included or excluded from the list of problems depending on the mode selected by the user. The mode is switched using the "Show waived"  button on the toolbar.

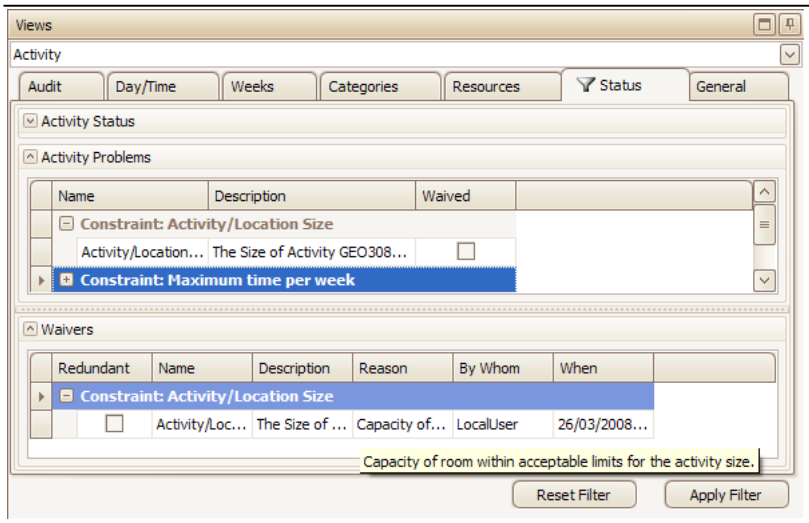


Figure 128 Waivers section open

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.

6.4 Unwaiving or Deleting a Waived Scheduling Problem

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.

6.5 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*.

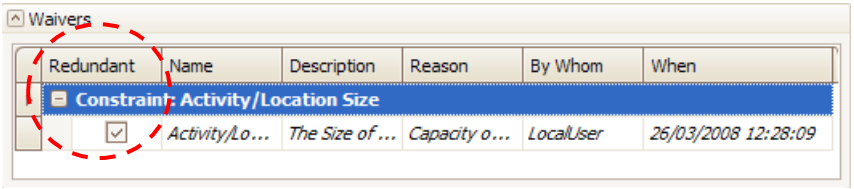


Figure 129 Redundant waiver

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*.

6.6 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*.

7 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.

7.1 "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.

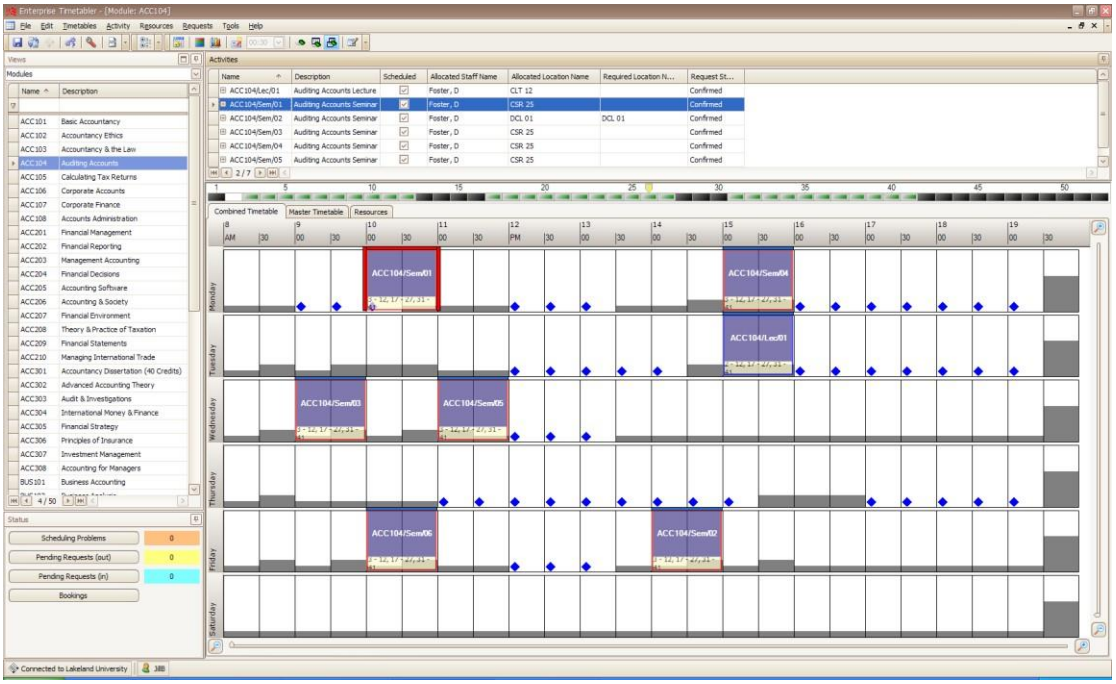


Figure 130 Full permission to allocate

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.

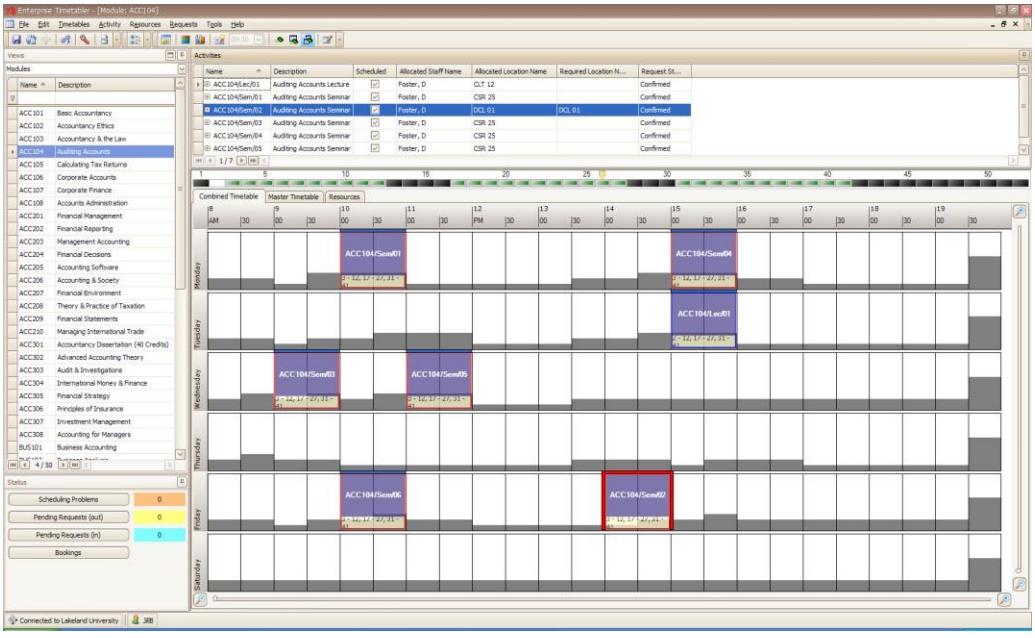


Figure 131 No permission to allocate location

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.

7.2 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*.

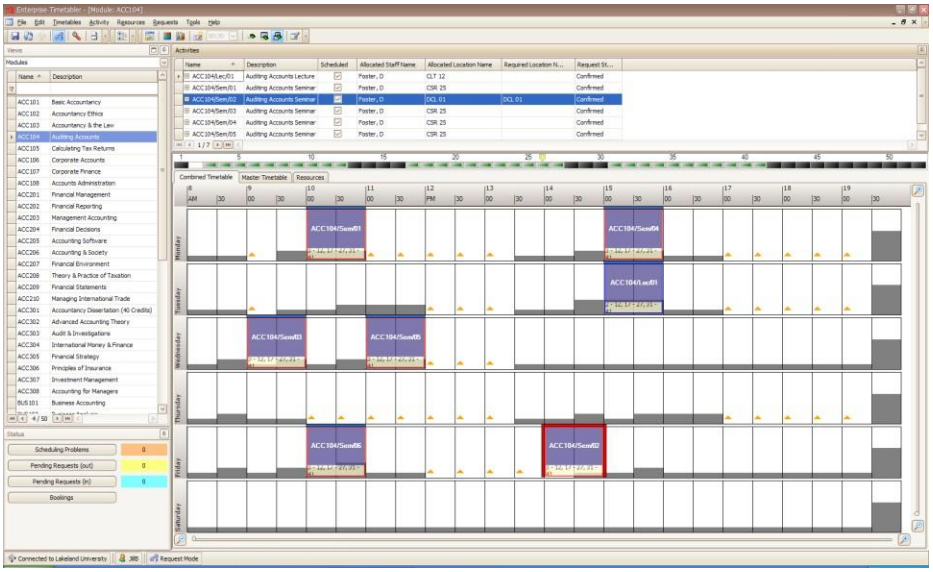


Figure 132 Request mode

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.

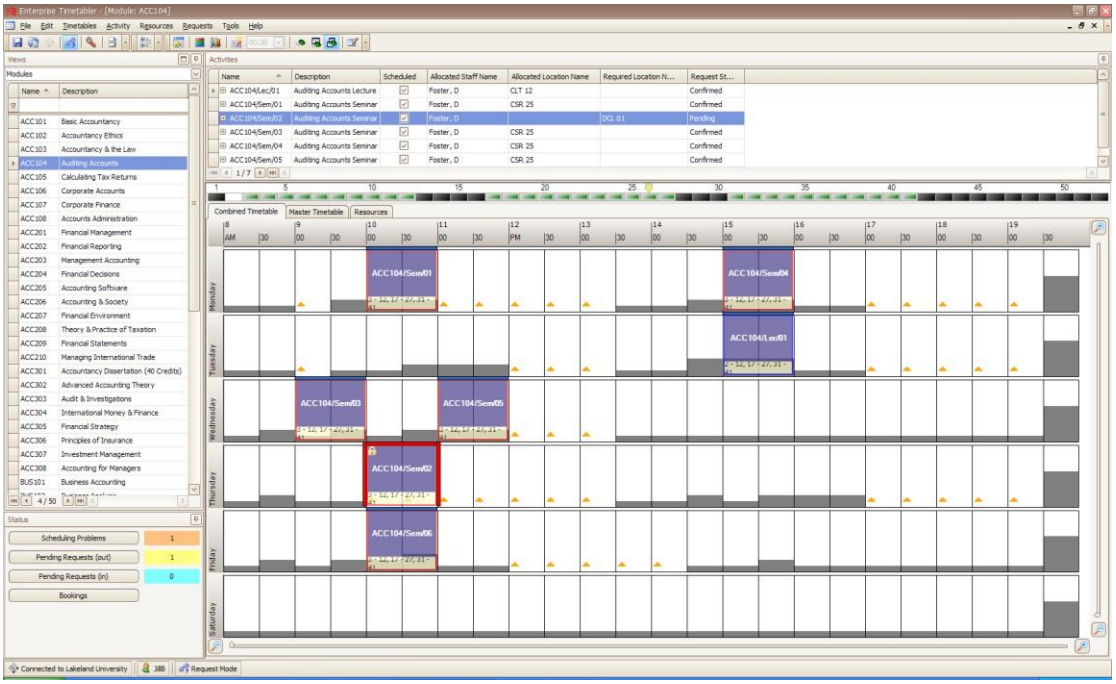
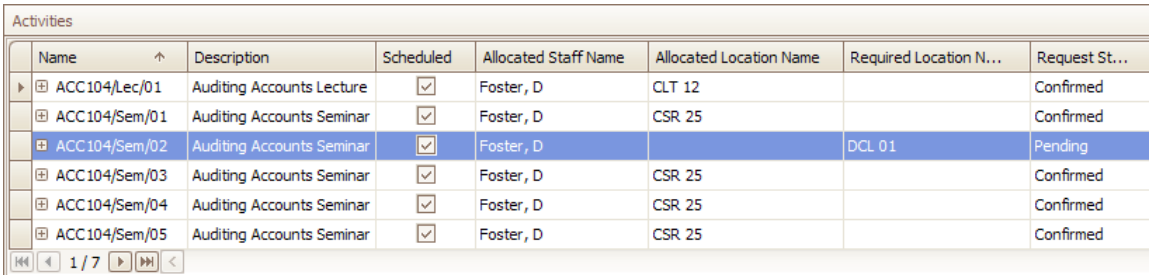


Figure 133 Pending request in timetable

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	☑	Foster, D	CLT 12		Confirmed
ACC104/Sem/01	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/02	Auditing Accounts Seminar	☑	Foster, D		DCL 01	Pending
ACC104/Sem/03	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/04	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/05	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed

1 / 7

Figure 134 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.

7.3 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**.

In **Request Mode**, , the user can use the **Resources Editor** to make any necessary changes to the resource requirements and then use the **Search** button to find suitable locations that are available at the required

time. Having selected an available room against which the user has request permission, clicking on the **Accept** button will generate a request for that room. This is indicated in the *Current* column by the word “Requested” in brackets, following the name of the resource.

Figure 135 Pending request in resource tab

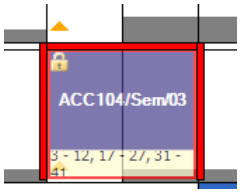
Once the activity has been adjusted, both the **Timetable** grid and the **Activities Spreadsheet** change to reflect the rescheduled activity. The activity is shown as pending in the *Request Status* column, but does not have a room listed in the *Allocated Location* column.

Activities

Name	Description	Scheduled	Allocated Staff Name	Allocated Location Name	Required Location N...	Request St...
ACC104/Lec/01	Auditing Accounts Lecture	☑	Foster, D	CLT 12		Confirmed
ACC104/Sem/01	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/02	Auditing Accounts Seminar	☑	Foster, D		DCL 01	Pending
ACC104/Sem/03	Auditing Accounts Seminar	☑	Foster, D		DCL 01	Pending
ACC104/Sem/04	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/05	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed

1 / 7

Figure 136 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 137 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".

7.4 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.

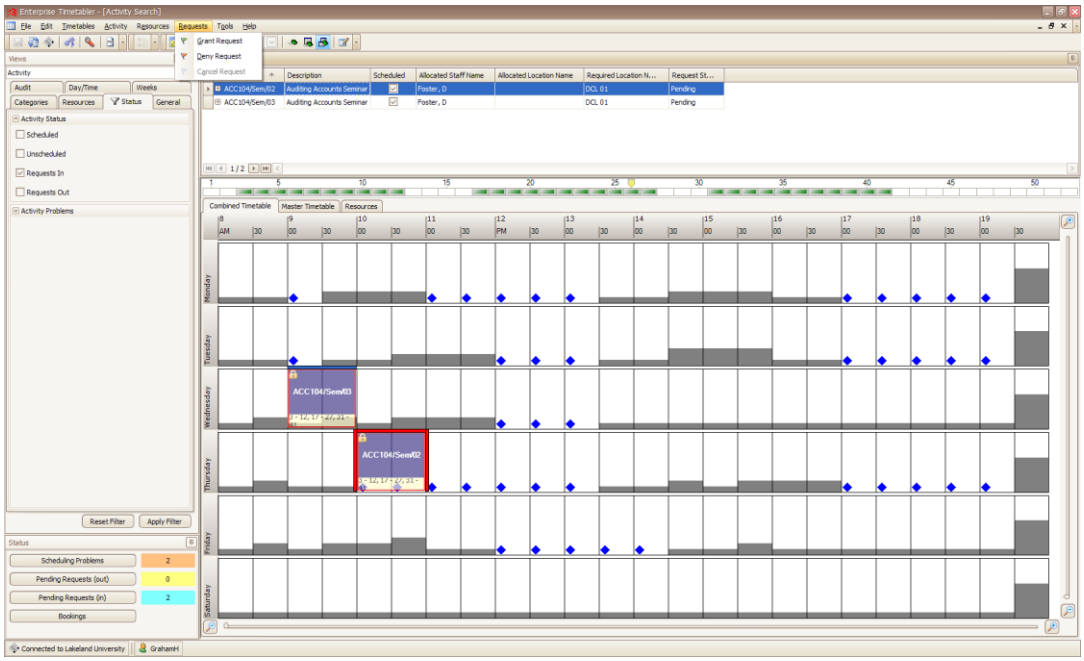


Figure 138 Granting a request

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

Activities

Name	Description	Scheduled	Allocated Staff Name	Allocated Location Name	Required Location N...	Request St...
ACC104/Lec/01	Auditing Accounts Lecture	☑	Foster, D	CLT 12		Confirmed
ACC104/Sem/01	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/02	Auditing Accounts Seminar	☑	Foster, D	DCL 01	DCL 01	Confirmed
ACC104/Sem/03	Auditing Accounts Seminar	☑	Foster, D		DCL 01	Pending
ACC104/Sem/04	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed
ACC104/Sem/05	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed

3 / 7

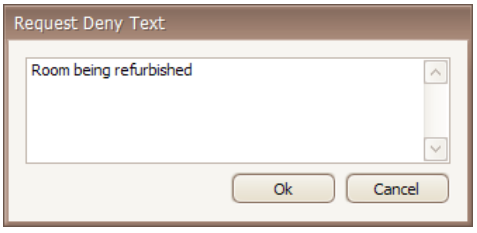
“Confirmed”, and the Allocated Location column will show the required room.

Figure 139 Granted request

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

7.5 Denying a Request

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.
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.

Figure 140 Denying a request

Activities

Name	Description	Scheduled	Allocated Staff Name	Allocated Location Name	Required Location N...	Request St...	Request Deny Text
ACC104/Lec/01	Auditing Accounts Lecture	☑	Foster, D	CLT 12		Confirmed	
ACC104/Sem/01	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed	
ACC104/Sem/02	Auditing Accounts Seminar	☑	Foster, D	DCL 01	DCL 01	Confirmed	
ACC104/Sem/03	Auditing Accounts Seminar	☑	Foster, D		DCL 01	Denied	Room being refurbished
ACC104/Sem/04	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed	
ACC104/Sem/05	Auditing Accounts Seminar	☑	Foster, D	CSR 25		Confirmed	

4 / 7

Figure 141 Denied request

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

8 Configuration, Filtering & Searching

8.1 Customisation 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:

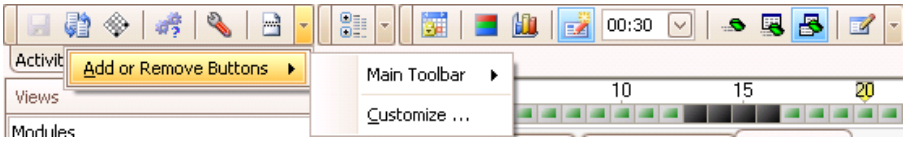


Figure 142 Tool bar

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

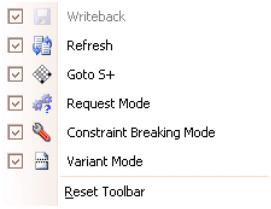


Figure 143 Icon selection

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

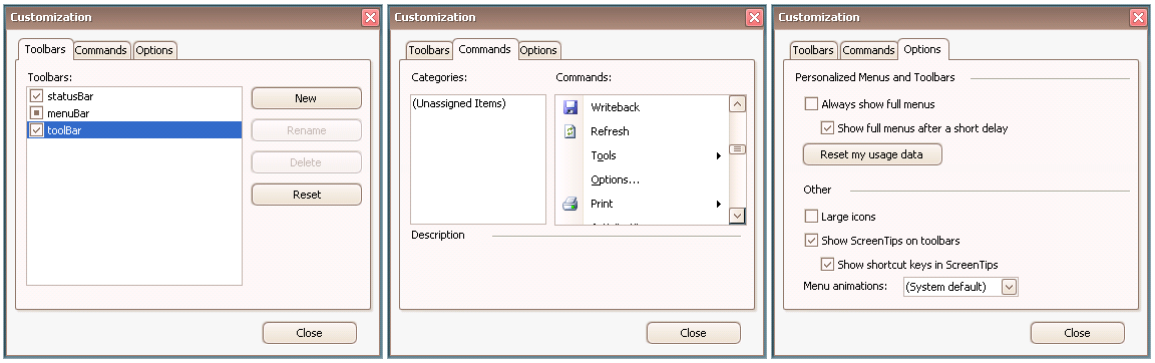


Figure 144 Custom selection of toolbar functions

8.2 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 145 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.

8.2.1 Audit Tab

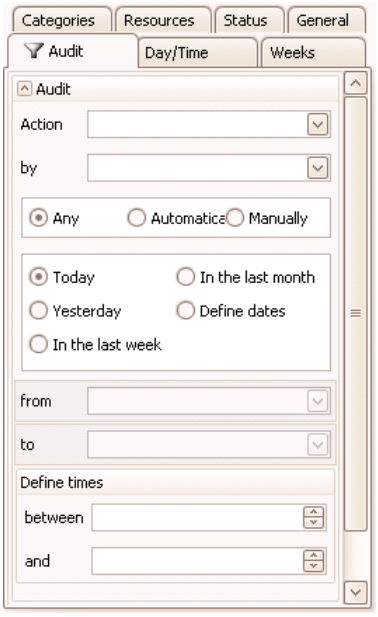


Figure 146 Audit tab

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.

8.2.2 Day/Time Tab

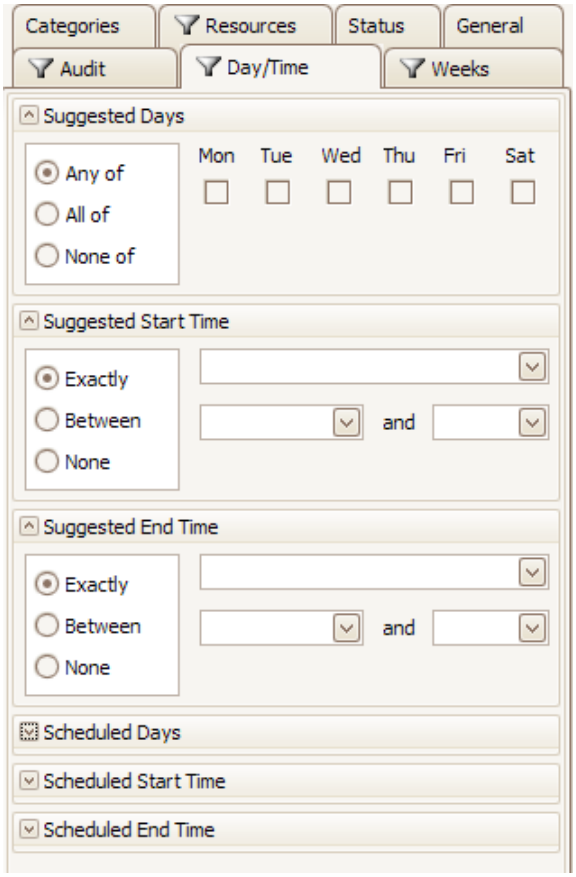


Figure 147 Day / Time tab

8.2.3 Week Tab

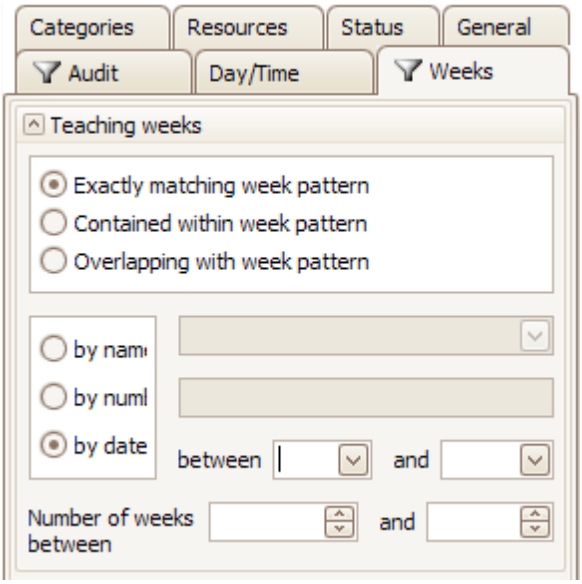


Figure 148 Filtering by weeks

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

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 two dates as boundaries).

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.

8.2.4 Categories Tab

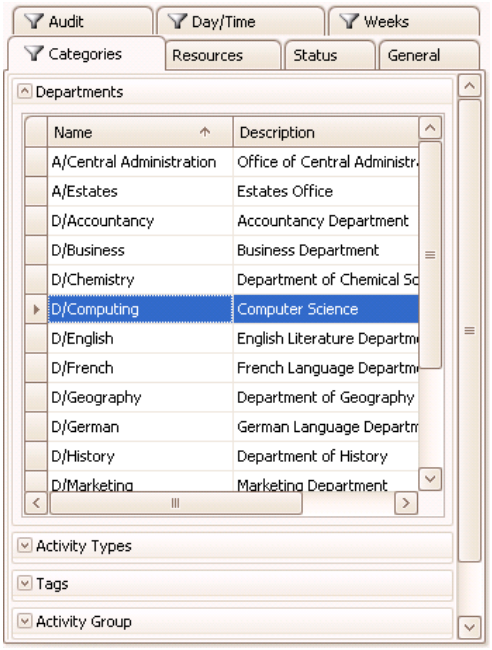


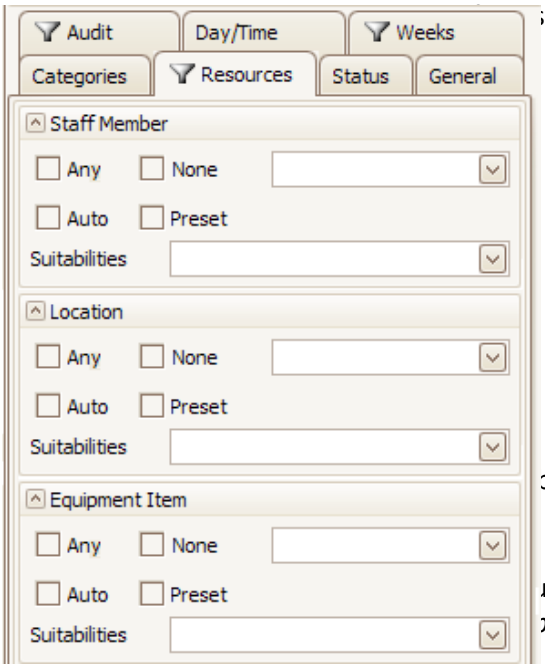
Figure 149 Categories tab

8.2.5 Resources 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
elected departments AND are of the selected type.



pe filtered by their resource allocation and requirement.
Location Equipment and *Zone*.

urce allocated, whether the allocation was automatic (wildcard)
bilities specified as a requirement.

The *Any* option in each case allows a search for activities that have any resource of the selected type while the *None* option allows a search for activities with no resource.

Figure 150 Resources tab

8.2.6 Status Tab

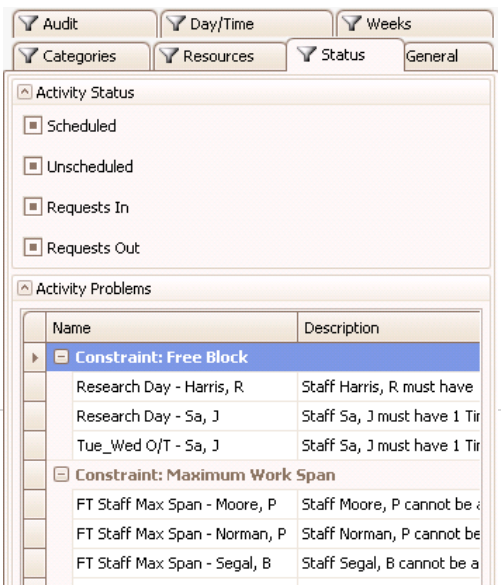
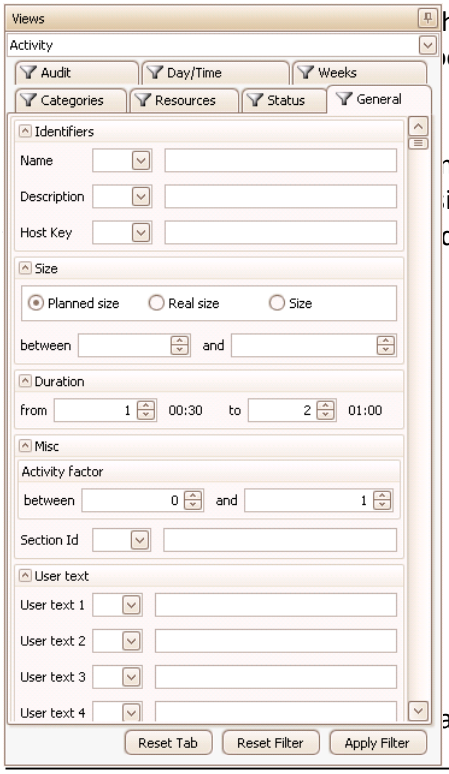


Figure 151 Status tab

8.2.7 General Tab

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.



hich enables the user to filter by various *Identifiers* (Name, Description, oked for is selected from a dropdown list (e.g. starts with, contains etc).

n can be against the *Planned size* (a figure entered by the user), *Real size* izes of the student sets allocated to the activity) or *Size* (whichever of d to be representative of the size of the activity).

applied using the Apply Filter button.

The filter can be cleared using the Reset Filter 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.**

9 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.

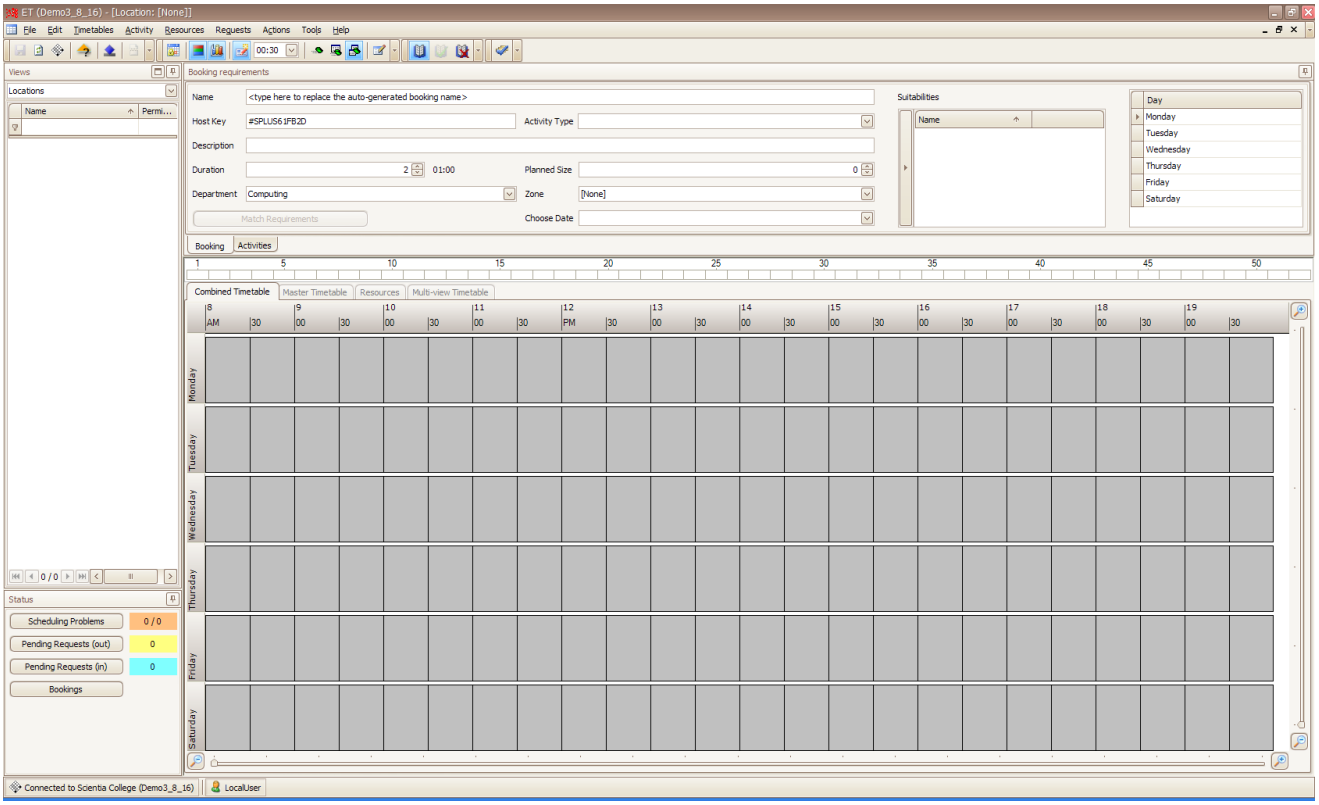

ET (Demo3_8_16) - [Location: [None]]
File Edit Timetables Activity Resources Requests Actions Tools Help
Views
Locations
Name
Permi...
Booking requirements
Name
<type here to replace the auto-generated booking name>
Host Key
#SPLUS61FB2D
Activity Type
Description
Duration
2
01:00
Planned Size
0
Department
Computing
Zone
[None]
Match Requirements
Choose Date
Suitabilities
Name
Day
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Booking
Activities
Combined Timetable
Master Timetable
Resources
Multi-view Timetable
8 AM
9 00
10 00
11 00
12 PM
13 00
14 00
15 00
16 00
17 00
18 00
19 00
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Status
Scheduling Problems
0 / 0
Pending Requests (out)
0
Pending Requests (in)
0
Bookings
Connected to Scientia College (Demo3_8_16)
LocalUser

Figure 153 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?

9.1 When do I need the resource?

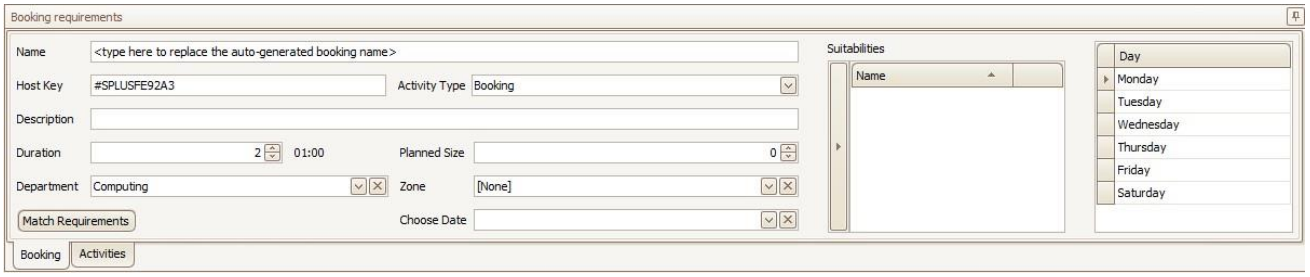
The user may specify when the resource is required in a number of ways. If the user is familiar with the week numbering system, they may select a week or weeks using the normal selection methods described in section 1.12. If the user wishes to make a booking on multiple days, those can be selected from 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. The  next to the drop down selection list can be used to negate the current selection, returning the field to a null state.

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

9.2 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:



9.2.1 Duration

Figure 154 Booking requirements

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.

9.2.2 Planned size

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

9.2.3 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. The next to the drop down selection list can be used to negate the current selection, returning the field to a null state.

9.2.4 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. The next to the drop down selection list can be used to negate the current selection, returning the field to a null state.

9.2.5 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 3.2.1 where the same control appears as part of the resource tab.

9.3 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 Match Requirements 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.

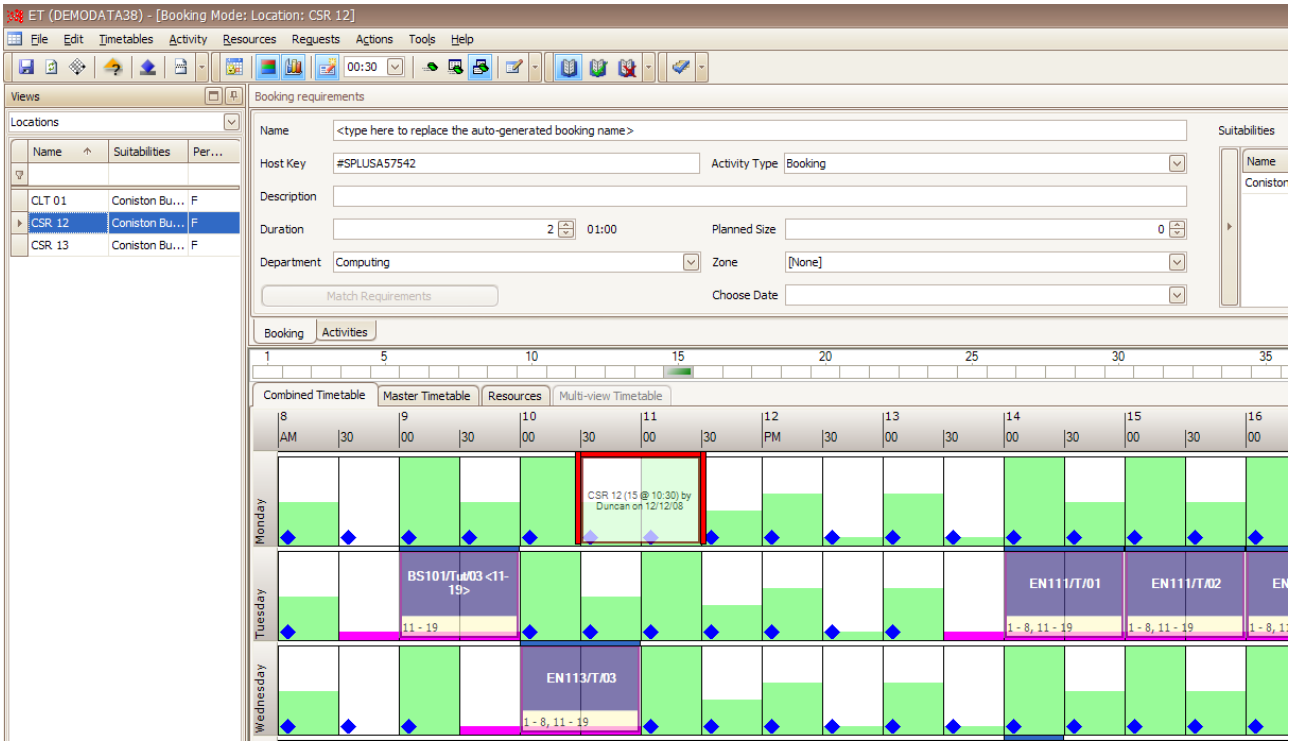


Figure 155 Booking proposed

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.

9.4 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 7.2) 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.

10 Customisation

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

10.1 Pinning and Unpinning Elements

The **Views Pane**, **Activities** spreadsheet 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.

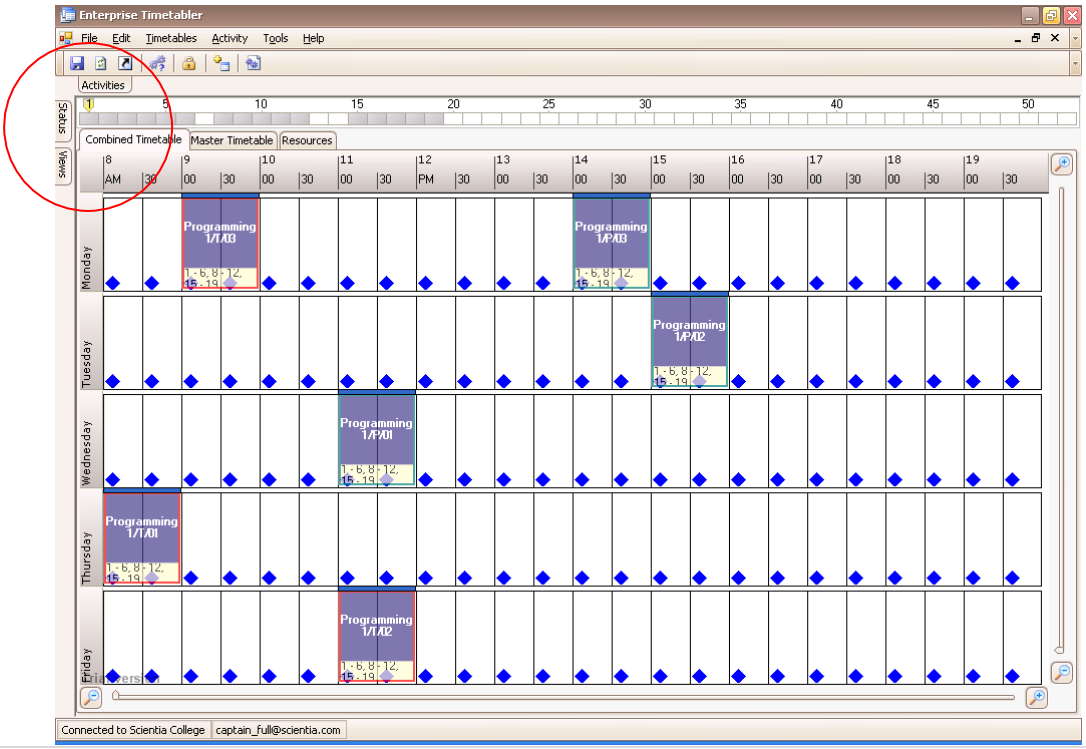


Figure 156 Panes unpinned

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

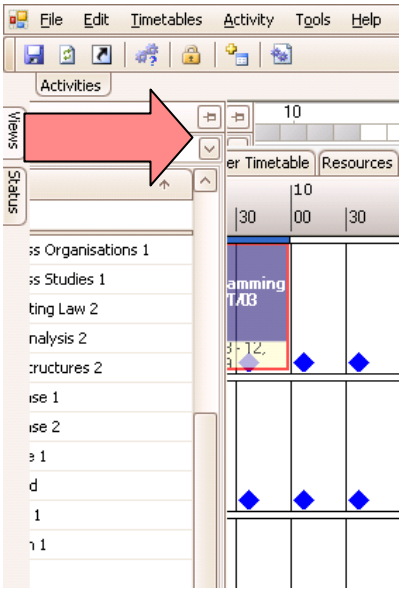


Figure 157 Accessing an unpinned pane

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.

10.2 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** spreadsheet floating, whilst the **Status** palette has been unpinned.

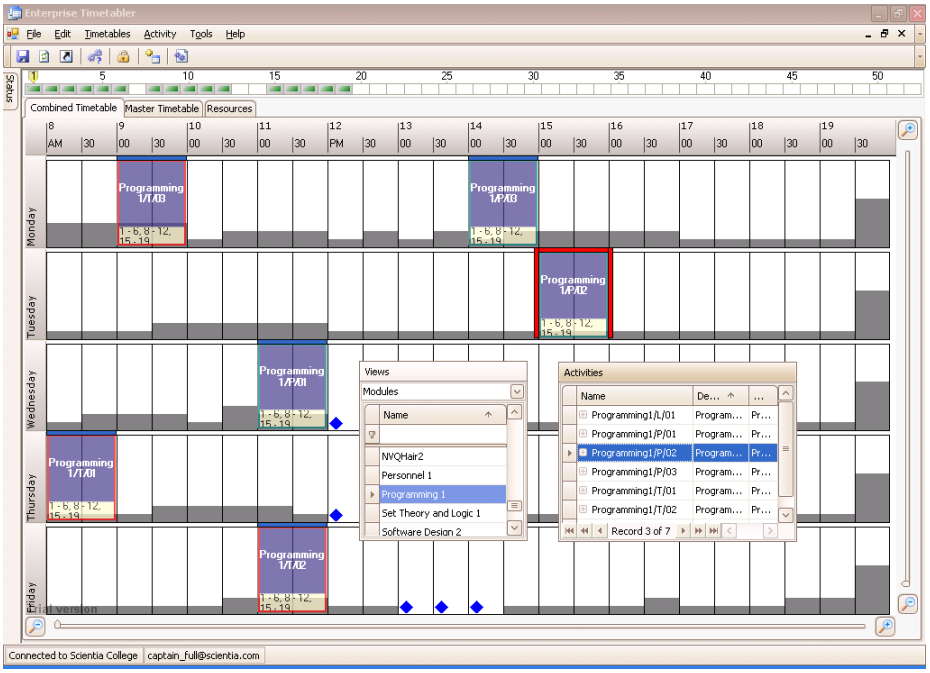


Figure 158 Floating elements

10.3 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.

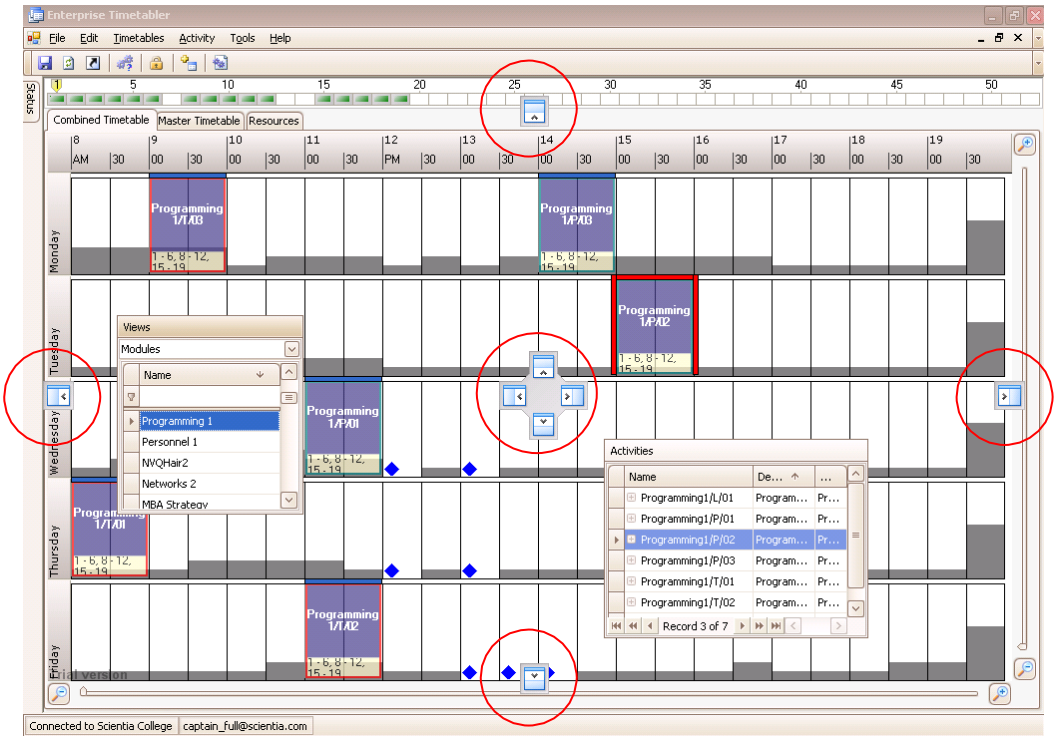


Figure 159 Positioning guides

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.

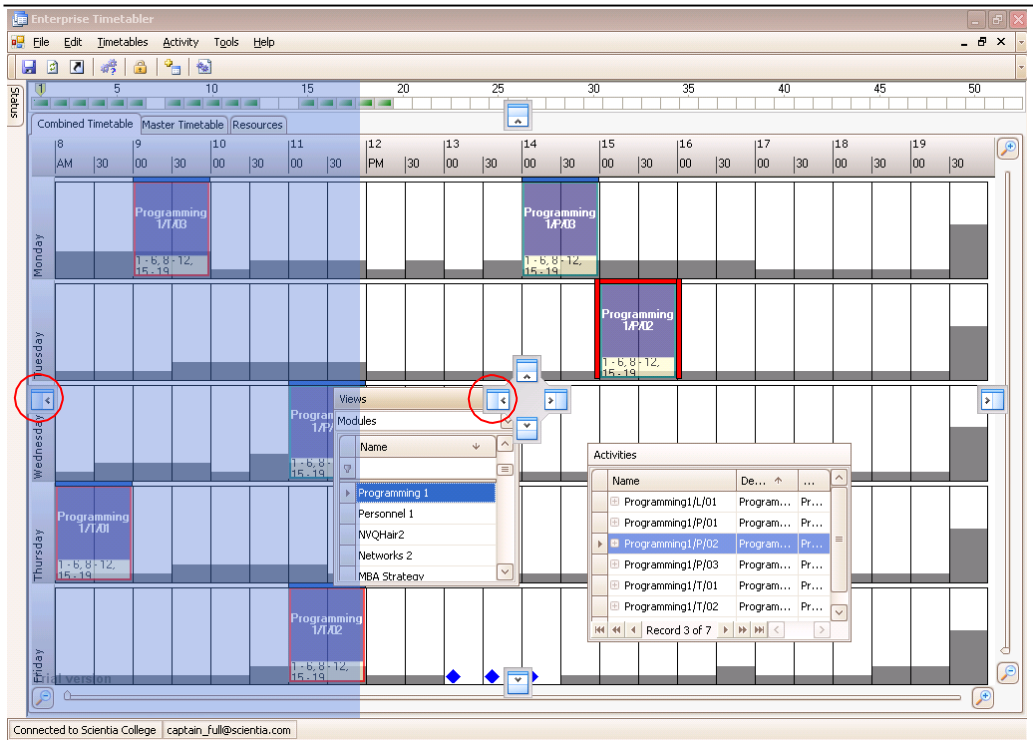
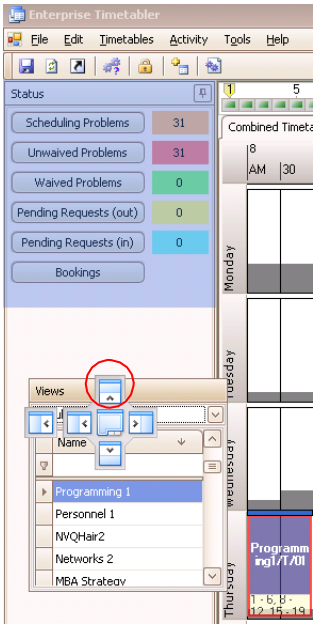


Figure 160 Positioning

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….

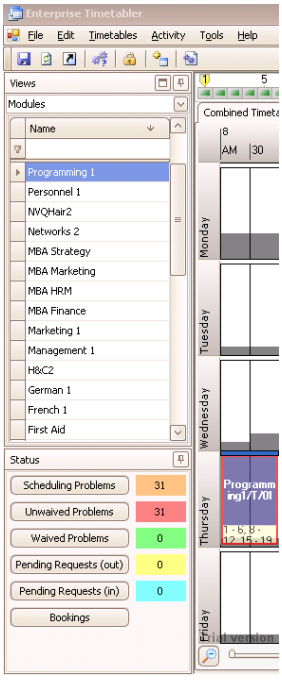
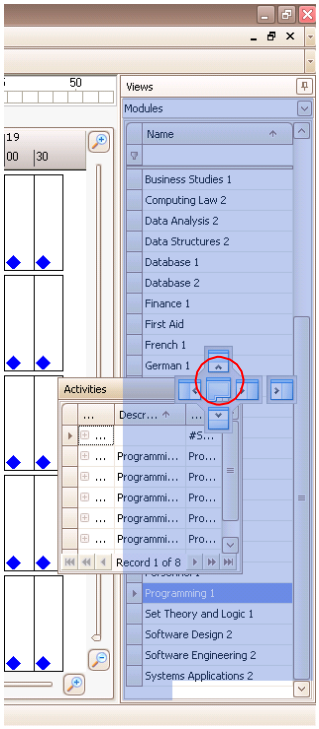


Figure 161 Repositioning the views pane

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 the process for positioning the **Activities** spreadsheet 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 of the palette. Selecting either of these will place the required palette on top.

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

In addition, the tabbed elements can be pinned and unpinned.

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

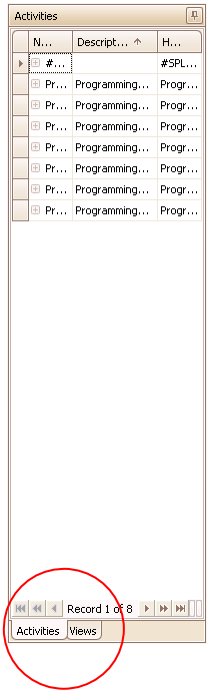


Figure 162 Tabbed display

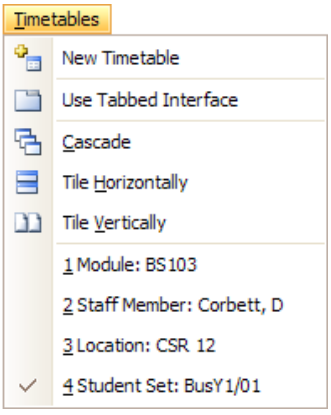
There are too many variations available to give examples of all the positioning possibilities, and it is therefore recommended that the user experiments with various combinations until their preferred layout is achieved. Default positions can be reset using *Tools | Reset | Layout*.

10.4 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.

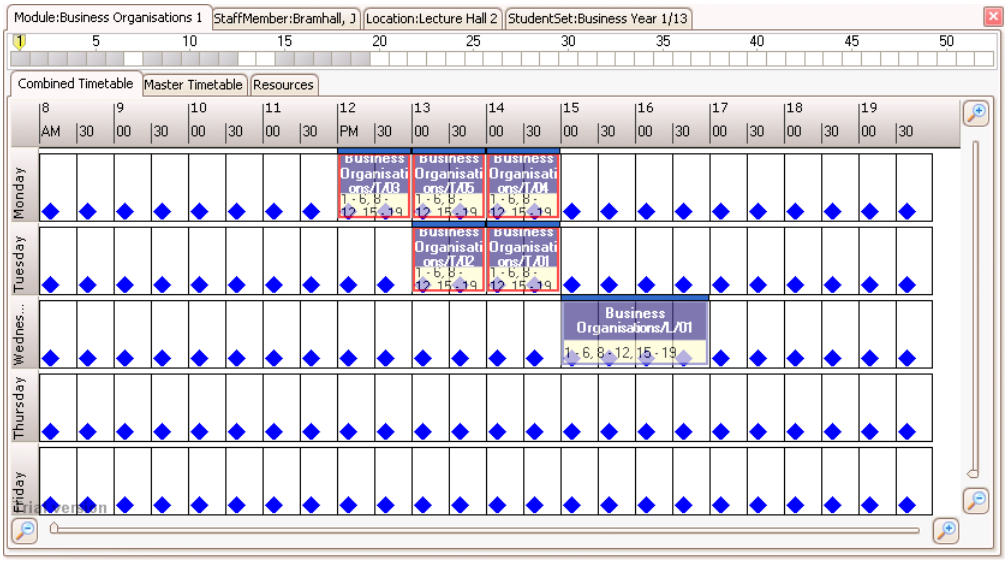


In this example, there are four timetables, one each for Module, Staff, Location and Student Set. The Student Set timetable is ticked, so is currently on view.

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

Figure 163 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.



The option Use Tabbed Interface 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 164 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-hand 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.

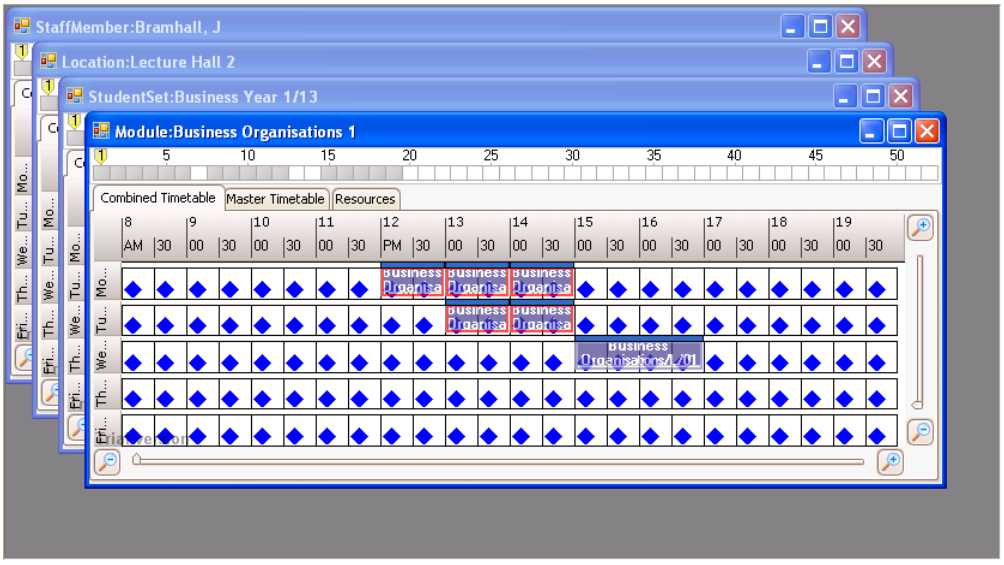


Figure 165 Multiple timetables in cascade view

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

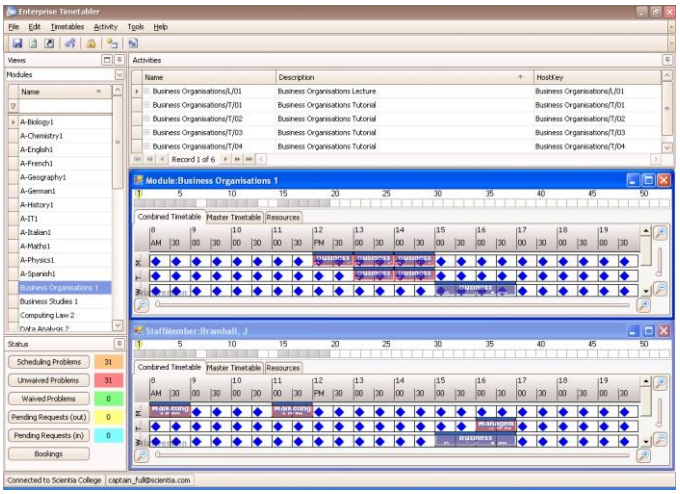


Figure 166 Multiple timetables tiled horizontally

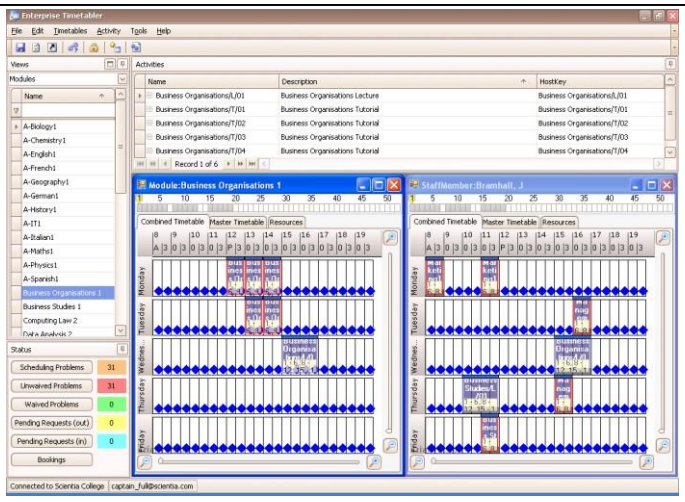


Figure 167 Multiple timetables tiled vertically

11 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 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.

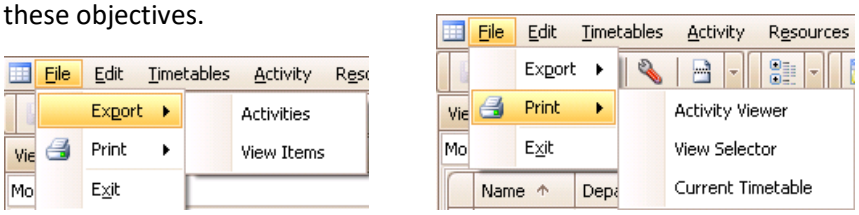


Figure 168 Export and print menus

11.1 Exporting Data

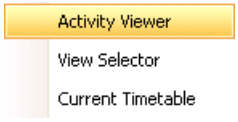
Choosing *Export* from the **File** drop-down menu will open up a secondary menu allowing the user to choose either **Activities** or **View Items** depending on which data the user wishes to export.

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.

11.2 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).

11.3 Printing the Activity Spreadsheet



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

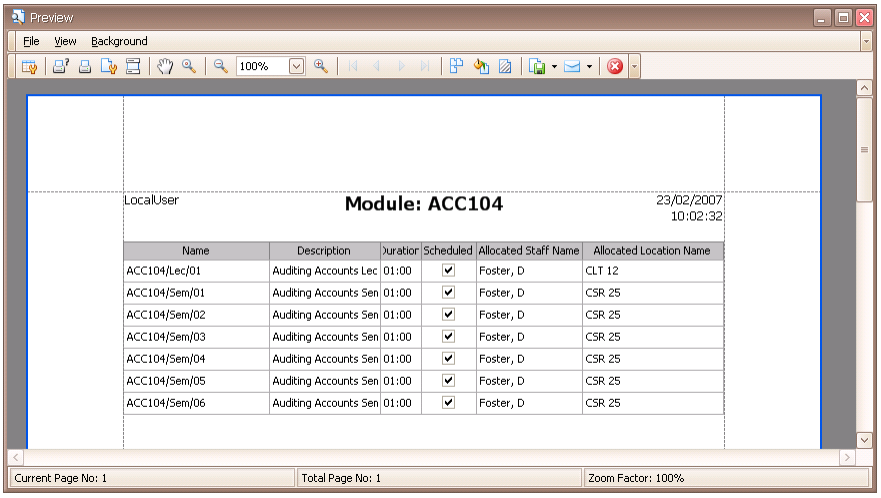
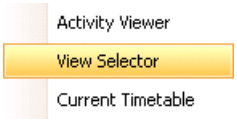


Figure 169 Activity spreadsheet print preview

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.

11.4 Printing the Views Pane



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

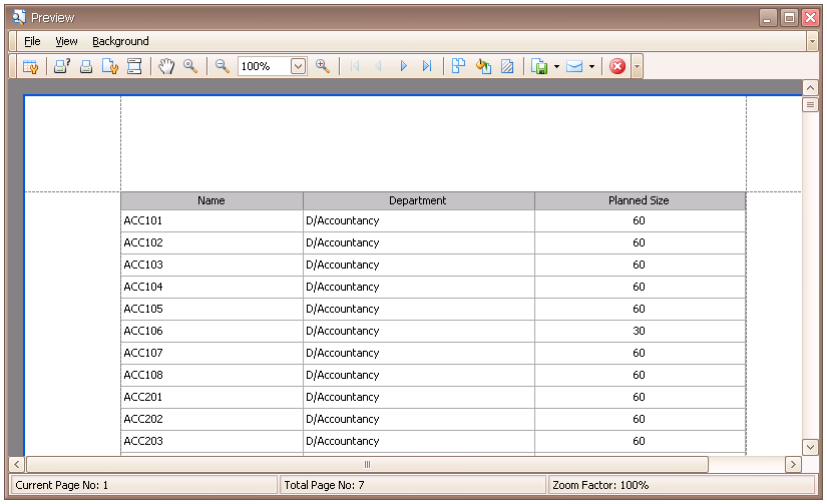
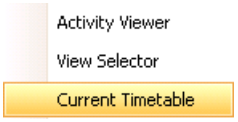


Figure 170 Print preview of views pane

11.5 Printing the 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.

Figure 171 Print preview of current timetable