BRITISH COLUMBIA | MyEducationBC

# Scheduling Module 8

# Workspace and Build Validation

**April 2015   v1.0**

FUJITSU

## Version History

| Version | Date | Description |
|---------|------|-------------|
| 1.0 | April 10, 2015 | Document created |
| | | |

## Confidentiality

## Table of Contents

# Introduction

This scheduling module covers the steps to create course sections, assign teachers to sections, manually enter constraints against sections, the build validation process, using the Build engine to create the master schedule and how to resolve issues encountered.

The Build engine will (try to) populate the following fields **Schedule Term, Schedule - Period(Day)** and **Room**, for all sections.  It will not schedule Teachers against sections, with one exception.

If on the Staff top tab > Assignments side tab you have indicated the Maximum and Minimum numbers of sections of a course, for a teacher.

> **Note:** During users first year of schedule building it is not recommended that the staff assignments are assigned from the Staff top tab > Assignments side tab. Using this option will add a great deal of complexity to the analysis of the results of a Build.

# 1.0   Initialize the Workspace

After you determine the number of sections you need to offer for each course, you must initialize the workspace.  This will create the number of sections for each course, indicated in the Course Details > Sections scheduled field

## 1.1   Steps to Initialize

1. Click the Workspace tab.
2. On the Options menu, click Initialize Sections. The Initialize Sections dialog box appears:
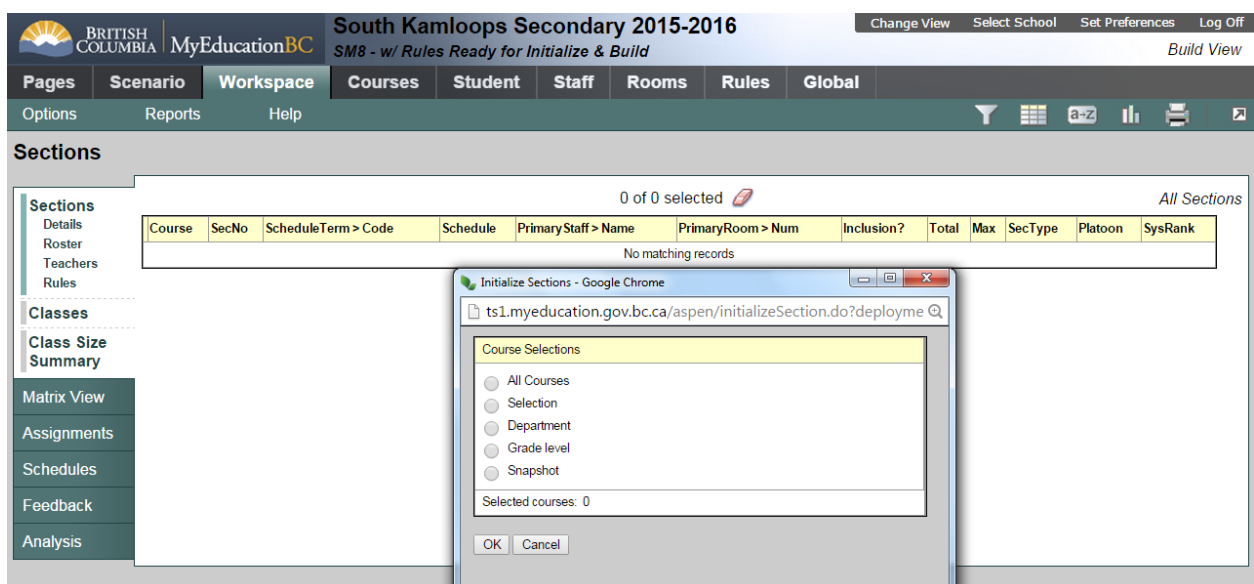
3. Select one of the following to select which courses you want to initialize sections for:
   - All courses.
   - Selection: A list of all courses appears. Select the courses you want to initialize.
   - Department: A list of departments appears. Select which departments of courses you want to initialize.
   - Grade level: A list of grade levels appears. Select which grade levels of courses you want to initialize.
   - Snapshot: A list of snapshots appears. Select the snapshot of courses you want to initialize.
4. Click **OK**.

The system creates the number of sections, for each course that you defined.  In the example below 253 sections were created:

# 2.0   Assign Teachers to Sections

Once sections are created, the distribution of teachers across sections can be completed. There are several methods available to complete this.

## 2.1  Section Details, Modify List and Mass Update

1.  Click on an individual section to enter the Details.

2.  Click the 🔍 symbol next to the **Staff > Name** and select a staff from the pop up:



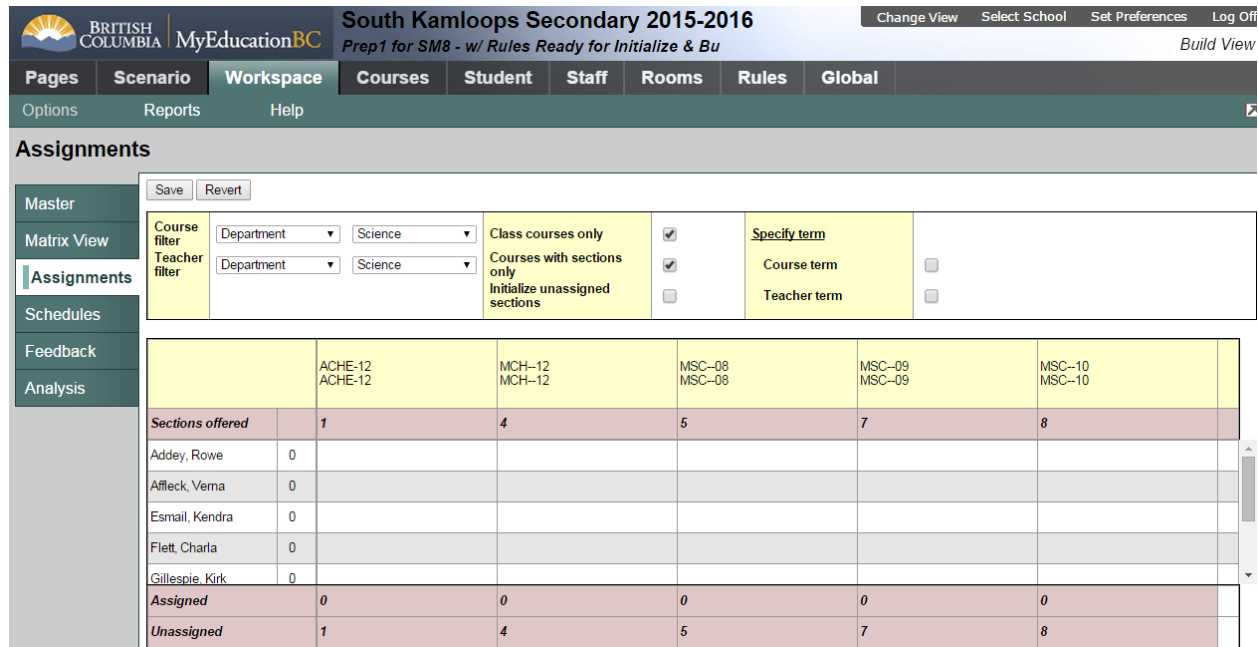3.  Click **OK**, on the pop up window.
4.  Click **Save**, on the course section detail.
5.  The teacher chosen is now assigned to this section.

The **Modify List** or **Mass Update**, available under the **Workspace > Options** menu, can also be used. Be sure when using Mass Update that you have done an Options > Show Selected for the appropriate list of course sections when assigning a given staff member.

## 2.2 Assignments

To create teacher assignments:

1. Click the Workspace tab.
2. Click the Assignments side-tab. The Assignments page appears:

| Pages | Scenario | Workspace | Courses | Student | Staff | Rooms | Rules | Global |
|-------|----------|-----------|---------|---------|-------|-------|-------|--------|

Options    Reports    Help

**Assignments**

| | | | | | |
|---|---|---|---|---|---|

Save    Revert

| Course filter | Department ▼ | Science ▼ | Class courses only | ☑ | Specify term | |
|---|---|---|---|---|---|---|
| Teacher filter | Department ▼ | Science ▼ | Courses with sections only | ☑ | Course term | ☐ |
| | | | Initialize unassigned sections | ☐ | Teacher term | ☐ |

| | | ACHE-12 ACHE-12 | MCH--12 MCH--12 | MSC--08 MSC--08 | MSC--09 MSC--09 | MSC--10 MSC--10 | |
|---|---|---|---|---|---|---|---|
| *Sections offered* | | *1* | *4* | *5* | *7* | *8* | |
| Addey, Rowe | 0 | | | | | | |
| Affleck, Verna | 0 | | | | | | |
| Esmail, Kendra | 0 | | | | | | |
| Flett, Charla | 0 | | | | | | |
| Gillespie, Kirk | 0 | | | | | | |
| *Assigned* | | *0* | *0* | *0* | *0* | *0* | |
| *Unassigned* | | *1* | *4* | *5* | *7* | *8* | |

This view allows you to see all sections of courses, within a Department and all Teachers assigned to a Department, depending on the filters chosen.

1. At the top of the page, click the **Course** filter drop-down to filter the courses that appear in the grid by Department, Grade level, or Snapshot. Each time you select a different value in a field, the page refreshes to display the appropriate courses in the grid.

2. Click the **Teacher** filter drop-down to filter the teachers that appear in the grid by Department, Grade level, or Snapshot. Each time you select a different value in a field, the page refreshes to display the appropriate teachers in the grid.

3. The **Select the Class courses only** checkbox should be checked when using the Course filter set to Grade in order to omit any courses with a master type of Package.

4. Select the **Courses with sections only** checkbox to display only courses with at least one section defined.

For each course (displayed in columns), the page displays the number of sections defined. At the bottom of each column, the page keeps a tally of how many of those sections are assigned and unassigned.

Staff members in the department appear in rows. Next to each staff member's name, the total *number* of sections for all courses assigned to the teacher appears.

> **Note:** This *number* is not just the number of sections that currently appear on the page based on the filters you define. It shows all sections that have been assigned to this teacher. Classes groupings of courses for teachers must be considered when reviewing the totals displayed.

In each cell of the grid, click into the cell and enter the number of sections of the course you want to assign to a teacher.

In the example below the **Course** filter has been set to **Department = Science**. The **Teacher** filter has been set to **Department = Science**.

| | | ACHE-12 ACHE-12 | MCH--12 MCH--12 | MSC--08 MSC--08 | MSC--09 MSC--09 | MSC--10 MSC--10 | |
|---|---|---|---|---|---|---|---|
| *Sections offered* | | 1 | 4 | 5 | 7 | 8 | |
| Addey, Rowe | 7 | 1 | 4 | | | 2 | |
| Affleck, Verna | 7 | | | 4 | 2 | 1 | |
| Esmail, Kendra | 7 | | | 1 | 2 | 4 | |
| Flett, Charla | 1 | | | | 1 | | |
| Gillespie, Kirk | 0 | | | | | | |
| *Assigned* | | 1 | 4 | 5 | 5 | 7 | |
| *Unassigned* | | 0 | 0 | 0 | 2 | 1 | |

1. Sections offered shows the number of sections created for each course.
2. Shows the number of sections assigned to each teacher.
3. Shows the total number of sections assigned
4. Shows the total number of sections that still need to be assigned to a teacher. There are still 2 sections of MSC--09 and 1 section of MSC--10, that need to be assigned to teachers.
5. Once sections are assigned, click **Save**.

Going back to the **Workspace**, we can now see that these sections have the teachers assigned:



| Course | SecNo | ScheduleTerm > Code | Schedule | Primary Staff > Name ▲ | PrimaryRoom > Num | Inclusion? | Total | Max | SecType | Platoon | SysRank |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ACHE-12-001 | 001 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MCH--12-001 | 001 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MCH--12-002 | 002 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MCH--12-003 | 003 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MCH--12-004 | 004 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MSC--10-004 | 004 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MSC--10-005 | 005 | | | Addey, Rowe | | N | 0 | 30 | | | 0 |
| MSC--08-002 | 002 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--08-003 | 003 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--08-004 | 004 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--08-005 | 005 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--09-004 | 004 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--09-005 | 005 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--10-006 | 006 | | | Affleck, Verna | | N | 0 | 30 | | | 0 |
| MSC--08-001 | 001 | | | Esmail, Kendra | | N | 0 | 30 | | | 0 |
| MSC--09-002 | 002 | | | Esmail, Kendra | | N | 0 | 30 | | | 0 |
| MSC--09-003 | 003 | | | Esmail, Kendra | | N | 0 | 30 | | | 0 |

**Note:** It is a school scheduler's choice if they want to assign teachers to sections prior to Building the schedule or after it is built. Often, if there is a teacher constraint, the teacher will be applied to a section prior to Building, for those section(s) that teacher teaches. For sections that do not have a teacher constraint, no teacher need be assigned prior to Building.

# 3.0 Pre-Schedule – Terms, Schedule and Rooms

Before the Build process is run, schools may want to indicate specific Terms, Schedules (Period/Day), or Rooms for sections. This is a way of putting direct constraints into the schedule. When these are pre-set/manually entered, the Build engine will not alter the settings and will schedule remaining sections around them.

## 3.1 Setting Section Details

1. Click the Workspace tab
2. Click on the Master side tab and then into Details of a Section:



a. Set a specific room
b. Set a specific Term
c. Set a specific Schedule (Period/Day) . A schedule cannot be set unless a Term is defined.
d. Set a teacher

> **Note:** The Build engine is NOT going to add teachers to sections.

3. Click **Save**

4. When any one of the first 3 are set, the **Prescheduled** check boxes to the right of these are checked on Save. Example: The section shown below was prescheduled to be in Room J211 Sci and the Prescheduled room check box is now checked. This checkbox is what the Build engine references to determine if the section was **Prescheduled**.



:

Looking back at the Section list, we can now see that this section is Prescheduled into this room:



**Note:** It is **VERY** important that schools realize the Build engine will populate a Room for all sections. This is very different from BCeSIS – which would not auto fill in a Room.

Schools must, therefore, use the Room Reservation Rule or Preschedule sections into rooms.

# 4.0 Validate for Build

The validate process checks to ensure all required scheduling attributes are set up. If any are missing you cannot run the Build process.
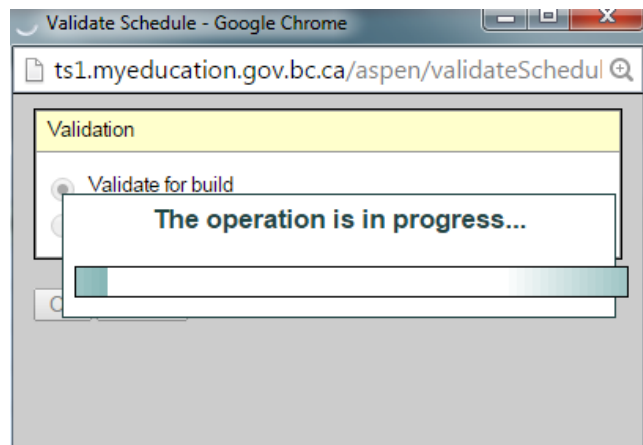
## 4.1 Process for Running – Validation

From the Workspace top tab > Master/Sections side tab:

1. Click **Options > Build > Validate**:
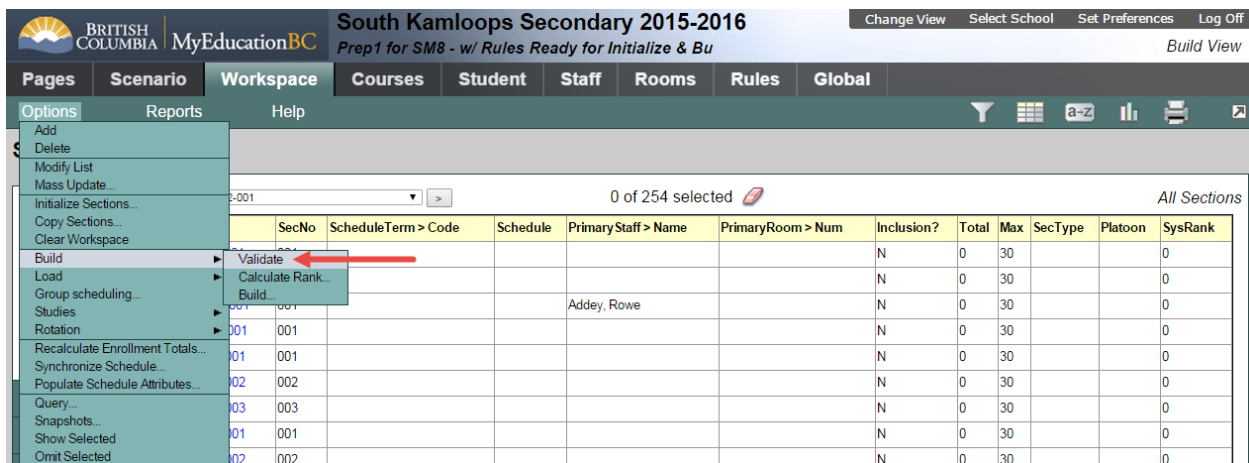


2. The **Validate Schedule** pop up window appears, click **OK**. The **Operation in progress** status will appear:



3. Once complete a Pink Message will appear indicating there are Fatal errors. Most schools will encounter errors; this is just part of the process. If no Fatal errors are encountered, a Green Message will appear indicating No Fatal errors.

## 4.2 Resolving Fatal Validation Errors

Once Build Validation is complete, the errors and information about them can be found on the **Feedback** side tab:



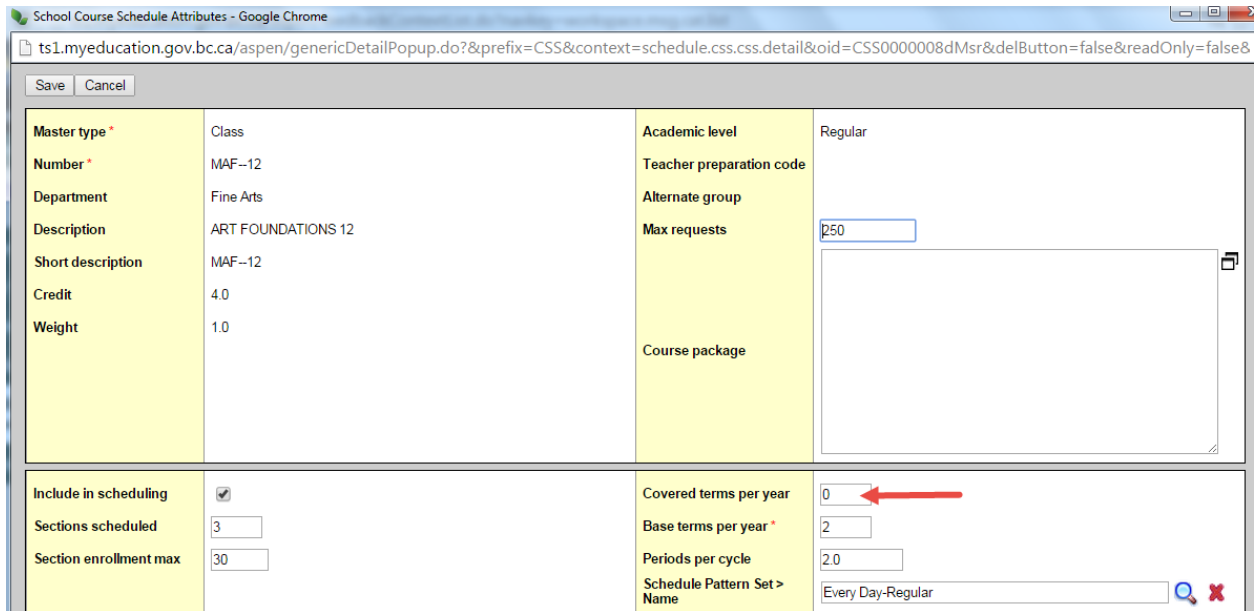Click on the link, **Fatal** for details of all errors:



The Messages are very accurate and should be read; they provide very detailed information.

To resolve an error click on the [Fix...] button. This will take you to a screen where the problem exists.

For example the first error:

***Field Course > coveredTermNumber must be greater than 0 (record: MAF--12, 2, value: 0)***

Clicking the [Fix...] will take you to a popup window displaying the Course > Details for MAF--12. You can see the **Cover terms per year = 0:**
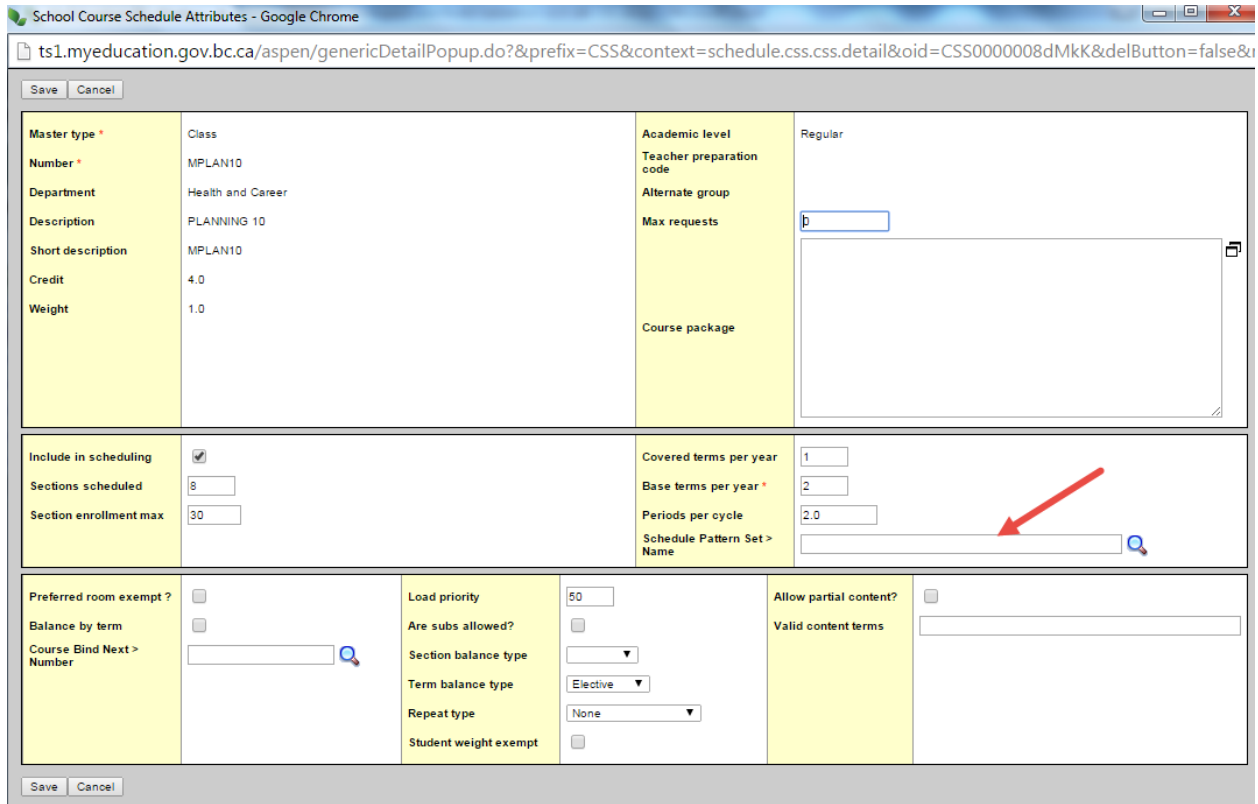


Change this to the correct value and click **Save**.

Resolve the next error: **Field Course > patternSet cannot be blank (record: MPLAN10, )**

Clicking **Fix...** will take you to a popup window displaying the Course > Details for MPLAN10:



In the above image you can see the *Schedule Pattern Set > Name is blank*.

Give this Course the appropriate **Pattern Set** and **Save**.

Once all **Fatal errors** have been corrected re-run the Build Validation process.  This is an iterative process that needs to be completed until **ALL Fatal errors** are corrected.

# 5.0  Build

## 5.1  Building the Master Schedule

Before you build the Workspace, you need to validate the Workspace. Validating the Workspace checks the data you have defined for the sections and alerts you to any problems the engine will have when you build (see the previous section for resolving Validation errors).

When you build your master schedule, the system attempts to fill in the schedule and room for each of the sections you have prepared on the Workspace tab, while abiding by the scheduling attributes and rules defined.

Steps to run the Build:

1. From the Workspace click **Options > Build > Build**
2. The Build Schedule dialogue box opens:



3. Select the Maintain scheduled sections checkbox if you want to keep any previously scheduled sections as they are.
4. At the Room assignment mode field, select one of the following:

- Assign valid room only: The scheduler assigns a room to a section only if it obeys all constraints. The build stops if a room cannot be found that respects all constraints.
- Assign best available room: When a valid room cannot be found for a section, the scheduler assigns a room based on the list of constraints that are set to be relaxed. The build stops if a room cannot be found after easing constraints.
- Assign blank if no room available: The scheduler schedules the sections even if a room cannot be assigned.

5. If you have defined specific courses as courses a teacher is qualified to teach on the Staff tab, Assignments side-tab, the Dynamic teacher assignment mode field appears. Select one of the following to determine how you want Aspen to schedule such courses:

- Leave blank if no teacher available: If the scheduling engine cannot schedule a qualified teacher for a section of a course, it leaves the staff member assigned to the section blank and continues the build process. For example, if several teachers have a course with six sections identified as something they are qualified to teach on their Assignments side-tab, and the engine cannot schedule a qualified teacher for two of those sections, it schedules the four sections it can, leaves the staff name blank for the two it cannot, and continues to build.
- Assign available teacher only: If the scheduling engine cannot schedule an available, qualified teacher for a section of a course, the build stops.
- Do not attempt: Aspen does not reference courses on the Assignments side-tab on the Staff tab.

6. Only select the **Save build files** checkbox if you are have been directed to. The information generated in this file can be used by the application developers to troubleshoot serious errors. Most schools do not have to select this checkbox during the build process.
7. Click **OK** to start the build

## How the Build engine proceeds

Once started, a progress window will open indicating the progress the builder is making through scheduling all sections in the Workspace.

The build might reach a section that it cannot schedule due to conflicts with previously scheduled sections. When this happens, the system attempts to reschedule previously scheduled sections to make room for the current section. If the system still cannot schedule the section after the repair attempts, the build will stop at that point and generates a **Fatal error**:

The process for resolving Build errors follows the same steps as correcting validation errors. Click on the word **Fatal** and the details of all errors open:



Build errors are often more complicated to resolve than Validation errors and will require a more complete analysis of all the scheduling attributes and rules used in this scenario.

You can also click the Rules leaf on the Workspace, Details side-tab to view any rules associated with this section. The rules are the restrictions that you place on a section and might be the reason the system is having trouble scheduling the section.

Then you build the schedule again, and the system stops at another section it is having trouble scheduling. Fix that problem and build again. Each time you build the schedule you have the option of locking the sections that are already scheduled, or unlocking them to be rescheduled.

You might want to save the Workspace as it is but continue to build the scenario. To do so, copy the scenario and rebuild the new copy.

When the system builds a schedule you are happy with, you can load students into the schedule (covered in the next learning event) to maximize section balances and requests satisfied.