4. Definition of group (distribution) constraints:

<groupConstraints>  
<constraint id="121" type="BTB" pref="R">  
<class id="1479"/>  
<class id="1480"/>  
</constraint>  
<constraint id="170" type="DIFF\_TIME" pref="-2">  
<class id="1615"/>  
<class id="1616"/>  
<class id="499"/>  
</constraint>  
<constraint id="1046" type="CLASS\_LIMIT" pref="R" courseLimit="160" delta="-20">  
<class id="1605"/>  
<class id="1606"/>  
<class id="1607"/>  
<class id="1608"/>  
<class id="1609"/>  
</constraint>  
<constraint id="1045" type="CLASS\_LIMIT" pref="R">  
<parentClass id="1609"/>  
<class id="1614"/>  
<class id="1615"/>  
</constraint>  
...  
<groupConstraints/>

|  |  |
| --- | --- |
| **constraint**: definition of a group (distribution) constraint | |
| id | constraint id |
| type | constraint type (see [[Group Constraint Types](http://www.unitime.org/uct_grconstraints_v24.php)]) |
| pref | constraint is either required or prohibited (hard constraint): R .. constraint is required, P .. constraint is prohibited or it is preferred or discouraged (soft constraint): -2 .. strongly preferred, -1 .. preferred, 1 .. discouraged, 2 .. strongly discouraged *(minimization of the overall group constraint preferences (for soft group constraints) is one of the optimization criteria)* |
| courseLimit, delta | CLASS\_LIMIT constraint only, the sum **courseLimit** + **delta** defines overall minimal class limit of the classes in the constraint *(default value for delta attribute is zero)* |

Each constraint also contains a list of classes (**class** elements) between which the constraint is being ensured. Only classes of the given problem (that is being described by the XML file) and the classes that have committed solution are included.

Constraint CLASS\_LIMIT is a special constraint that is connected with the classes that does have defined minimal and maximal class limit (attributes minClassLimit and maxClassLimit). It is always required and it ensures the following properties:

* limit of a class (that does not have any children classes) is MIN ( maxClassLimit, assignedRoomSize/roomToLimitRatio ) *(assignedRoomSize is the size of the assigned room, in case of multiple rooms (nrRooms>1), it is the size of the smallest room that is assigned to a class)*
* limit of a class (that does have children classes) is MIN ( maxClassLimit, assignedRoomSize/roomToLimitRatio, sumChildrenClassLimits ) *(sumChildrenClassLimits is the sum of the class limits of the children classes)*
* sum of class limits of classes in the CLASS\_LIMIT constraint (all classes of the same scheduling subpart, with the same parent class) is equal or greater than minClassLimit of the parent class *(****parentClass*** *element pointing to the parent class is defined for the constraint in this case)*
* for the top most classes (classes with no parents), sum of class limits of classes in the CLASS\_LIMIT constraint (all classes of the same scheduling subpart) is equal or above course limit *(****courseLimit*** *attribute defining the desired minimal class limit of the classes in the constraint is defined in this case)*  
  *(in some cases attribute* ***delta*** *is also defined, it is a compensation for classes of the subpart that are of different problems (and that do not have any committed solution yet), minimal class limit of the classes in the constraint is than equal to* ***courseLimit*** *+* ***delta****)*