

To: Jay Raja, Senior Associate Provost

From: Richard Buttimer, Chair, Scheduling Policy Committee

Re: Final Update

Date: December 15, 2015

In February of 2015 you formed an ad-hoc committee of Associate Deans and senior staff members to examine the university classroom scheduling guidelines. The purpose of this memo is to provide you with an update on the committee's activities and findings to date, and the committee's plans for moving forward.

The committee was charged with examining a wide range of issues:

- Issues relating to the current guidelines
- Review current room priority assignments and revise assignment. Also discuss a framework/basis for assigning priority
- Classroom and Lab utilization – targets and tracking
- Examine classroom size mix for our current class offering
- Cataloging of types and quality of classrooms
- MWF schedule for freshman and sophomore classes (start with Freshman in 2016-2017 year) to improve retention and campus culture.
- Guidelines for online and flipped class scheduling and monitoring

The committee has worked diligently through the spring and fall semesters, including analyzing a significant amount of data. As we have discussed, the committee has come to a number of conclusions and recommendations which I have outlined below. Although the committee does make a number of recommendations, there are still certain questions that the committee felt could use additional consideration. To that end the committee recommends that the campus hire an external consulting group, such as Ad Astra or R25, to look at these additional issues.

Moving to a MWF class schedule

The committee spent a great deal of time discussing and analyzing the potential for moving to a MWF class schedule. Here are the main conclusions the committee reached:

1. If a move is made to MWF schedule, it should be for all undergraduate classes not just the lower division.

The committee felt that maintaining separate schedules for lower and upper division courses would be very difficult logistically. Certain classrooms or buildings would have to be designated as lower-division only and this would greatly reduce section scheduling flexibility. In fact, the committee felt that a split scheduling system would likely reduce overall scheduling efficiency rather than improve it. Additionally, many students, and especially transfer students, simultaneously take sophomore-level and junior-level classes.

The committee felt it was quite likely that these students would skip Friday sessions if their other classes were not meeting on Fridays.

2. The committee was neutral as to the pedagogical benefits of MWF or MW scheduling.

The committee saw no compelling pedagogical reasons for selecting either a MWF or MW schedule. The committee's sense was that while there were some areas in which students might benefit from a MWF schedule, there were other courses and programs for which MWF would create problems. The committee noted that certain programs with external clinical or student-teaching requirements would find MW to be a better schedule for their students than MWF.

3. Campus operations should be the determinant of MWF vs MW schedule.

Given the committee's neutral view on the pedagogical merits of the MWF and MW schedules, it felt that operational efficiency should be the decisive factor. The committee fully acknowledged that issues such as parking, traffic, auxiliary operations, and campus culture could be positively affected by a move to MWF. The committee also felt that many of these same efficiencies could potentially be gained by requiring a higher percentage of classes to have a Friday component under the current system. The committee did not feel it had appropriate expertise, data, or understanding of those operations to make a formal recommendation. The Chancellor has convened a separate task force, which I am chairing, to look at campus congestion. One of the major issues that committee will look at is whether moving to a MWF could improve campus congestion and other operational issues.

4. There are efficiencies in a MW schedule that could be lost with MWF schedule.

Currently campus classes are spread relatively evenly throughout the day Monday through Thursday. Students accept and will sign up for classes that start at 3:30. Further students take classes relatively uniformly throughout the day on both MW and TR. If the campus moves to a MWF schedule there is a very high likelihood that classes offered MWF after about 2:00 would become much less accepted by students. This might result in a compressing of student demand into the 8:00 am – 2:00 pm time slots. This might also result in TR classes becoming much more in demand than they are now. Again, the net result might well be a compressing of demand into a smaller time frame than we now experience.

Another potential efficiency loss has to do with class transitions. Currently with a MW schedule there are six full 75 minute class periods between 8:00 am and the end of the last daytime class at 4:45. So of the 525 minutes between 8:00 am and 4:45 pm, 450 are devoted to class and 75 are spent on class transitions. With a MWF schedule there can be 8 full 50 class sessions between 8:00 and 4:25. Of the 505 minutes between 8:00 am and 4:25 pm, 400 are devoted to class and 105 are devoted to class transition periods. Thus a MWF schedule uses 79.2% of the available minutes in class while a MW uses 85.7%. Further, the committee noted that moving to eight classes per day would increase the number of times per day that students (and potentially faculty) either leave or come onto campus.

To counter-balance that efficiency argument, however, the committee did note that the MWF schedule potentially allowed for the university to more easily transition to a schedule with 20 minutes between classes. This might allow students to more easily access classes located at the extreme ends of campus either through walking or the campus shuttle system, something that is only marginally feasible with the current 15 minute sessions. To do this would require adding a total of 35 extra minutes in transition times for a day, which could be done while still allowing the eighth period to end before 5:00 pm.

5. If the campus moves to MWF schedule, it should only be for classes before 2:00. After 2:00 the campus should remain on a MW schedule.

The committee felt that if the campus moves to a MWF schedule, removing the late afternoon Friday sessions has many benefits. First, it would hopefully partially alleviate the concerns discussed in point 4 above. Second, it would allow for departments that wanted to run longer classes to still be able to schedule one day a week classes for Friday afternoons. Third, this schedule would also allow ample time on Friday afternoons for faculty meetings, committee meetings, research seminars and other important non-teaching activities. The committee looked at other UNC system schools and noted that from the data available, ECU, NC Central, NC State, UNC Asheville, UNC Greensboro, and UNC Wilmington all use a MWF schedule during the morning but allowed MW in the afternoons.

Scheduling Procedures and Issues

In keeping with its mandate, the committee not only looked at the MWF issue but also look at a number of other issues relating to classroom scheduling and efficiency. Here are the main findings and conclusions the committee reached:

1. UNC Charlotte is relatively efficient in usage of its classroom facilities relative to other components of the UNC system.

UNC Charlotte is essentially tied with NC State (with Appalachian State and Fayetteville State very close) in terms of having the highest average weekly total hours of instruction per classroom. Daytime usage is roughly the average of the UNC system, but evening usage is by far the most intense in the system making our aggregate usage the second most intensive in the system. Given our urban mission some tradeoff between day and evening is inevitable. While the committee agrees there is room to increase usage, especially on Fridays, the usage increase is likely to be marginal.

2. Classroom Data

Data on classroom size has historically been poor, although there is an ongoing effort to improve the data quality. This appears to have caused some misleading reporting of utilization. We recommend that efforts be made to improve the classroom inventory data and to purchase or develop additional software tools to analyze the data. The current systems available are manually intensive and do not allow for easy analysis of classroom usage by unit, day, and time. This is an area where the committee felt hiring an external consulting firm such as Ad Astra or R25 could be particularly beneficial.

3. Classroom Mix

The university appears to have the wrong mix and distribution of classrooms:

- a. There are too many 150+ classrooms, and not enough 50-100 seat classrooms. This results in 75-100 student classes being assigned to very large classrooms. This problem was exacerbated by the imposition of the GA policy that treats all sections as equal, regardless of section size.
- b. There may be too many small classrooms as well, but that is more difficult to see from data. There is at least some anecdotal evidence that there are small enrollment courses that if appropriate sized classrooms were available would be scheduled by academic units to accommodate larger numbers of students.
- c. The distribution of large, mid-size, and small classrooms is not uniform across campus. For example, Zone 5 has fewer large and mid-size classrooms than other sections and more small classrooms, despite having academic units that are capable of using the larger classrooms. CRI has more large classrooms, but they are not as easily utilized by other units.
- d. Campus congestion is a significant factor in the ability of units to effectively utilize available space on distant parts of campus.

4. Classroom Priority System

For many years the campus has operated on a classroom priority system under which colleges and departments have had the right to schedule certain classrooms before the rest of the campus. This has led to concerns about how those classrooms have been utilized. The committee examined the scheduling and use of those rooms and came to the following conclusions:

- a. **In general, classes assigned by academic units to their priority classrooms appropriately utilize the space.**

Classrooms are currently assigned in a two-part process. First, colleges and departments manually assign classes to spaces for which they have priority. Second, all unassigned classrooms, including unassigned priority classrooms, are released back to the Registrar's office. The Registrar's office then uses auto-scheduling software to allocate unused rooms. The Registrar's office then works with the academic units to tweak the results of the auto-schedule.

Academic Affairs has promulgated guidelines for how academic units should use priority classrooms. One such guideline is that the projected enrollment in a class should equal at least 75% of the physical capacity of the classroom. An initial look at priority space usage, however, appears to show that frequently priority classrooms have smaller classes in them than required by this guideline. The committee looked at this in some detail and found that generally these courses were not assigned by the department or college during the first stage of scheduling but rather were assigned during the auto-schedule phase.

It is relatively straightforward to see why this happens. The priority classrooms tend to be the larger classrooms, and the departments that have the priority for them use them to schedule their large sections. By the time the prioritized classrooms are returned to the Registrar's office for auto-scheduling, most of the large sections are already scheduled. This results in the auto-scheduler essentially using the classrooms as "last resort" space for smaller classes. The committee came to the conclusion that the assignment of smaller classrooms to priority space was not a sign that academic units were misusing the priority assignment system, but rather was a strong signal that the university has the wrong mix of classrooms. For the current size of our student body and faculty, the university has too many 150+ seat classrooms and not enough 50-100 seat classrooms.

b. **The rules around early morning usage of priority classrooms should be enforced by Academic Affairs or the Registrar's office.**

Another rule which Academic Affairs has promulgated is that in order to retain priority rights to a room an academic unit must make use of that room during non-prime-time hours, especially at 8:00 am. While the committee noted that units tended to do well in meeting the class size requirement, there was much less consistency in meeting the 8:00 am scheduling requirement. This would appear to be a useful rule to enforce and one which could be enforced very early in the scheduling process. It would appear to be straightforward for the Registrar's Office or Academic Affairs to run a report at the end of the priority room assignment period to see which priority rooms were not scheduled for 8:00 am classes at least Monday through Thursday. Units could then be given the choice of using the space at that time or giving up future priority to that space.

c. **The classroom priority list should be formally reviewed on a set schedule.**

Currently there is no formal structure for periodically reviewing the priority list. The current list has been in place for many years and has not been updated except as new buildings or renovated spaces came online. The committee examined the current list and compared it to classroom usage for a couple of semesters. While the committee did not see any gross misalignment, it came to the conclusion that there should be a formal period review process. This process should include specific metrics for room utilization in order for a unit to retain its priority allocation, and should include sharing the list with schedule builders.

5. **Off-Schedule Classes**

The committee spent considerable time looking at classes which did not appear to follow standard university scheduling guidelines. Based on this analysis, the committee came to the following conclusions:

- a. Most of the "off schedule" classes are doctoral/graduate classes, breakout sessions, labs, or other legitimate use cases.

- b. In some cases off-schedule classes are driven by availability of adjuncts or other non-standard instructional needs.
- c. Taken as a whole these classes did not appear to be causing major disruptions or other inefficiencies.

6. **Hybrid Classes and Recitation Sections**

The committee examined the role of hybrid classes and recitation sections on scheduling efficiency. One difficulty the committee ran into is that hybrid sections did not appear to be consistently marked on the schedule as being hybrid. There was also some anecdotal evidence that some faculty members may be “rolling their own” hybrid classes. That is, they may be taking a course that the department intends to be a standard course and hybridizing it by putting content online with no help from the department, the Center for Teaching and Learning, or other resources. The committee recommends that there be a systematic effort over the next semester or so to determine the degree to which courses that have a hybrid component are not marked as hybrid on the schedule.

The committee did note that if hybrid classes are not implemented carefully they have the potential to reduce classroom scheduling efficiency. A hybrid class that only meets once a week should not be assigned a classroom space for the times when it is not meeting. The simplest solution would appear to be to simply require each academic unit to always “pair up” hybrid classes so that one class or the other is always using the classroom. One challenge to this approach comes during final exams when two courses need to have classroom space available. Two potential solutions are to either require hybrid classes to use online final exams or to formally allow hybrid classes to administer final exams during their last in-person class meetings. A second challenge is Banner. Currently Banner will not allow two hybrid classes to be scheduled simultaneously in the same room at the same class time, unless the courses are cross-listed. Banner should be reconfigured to allow any two courses with a hybrid tag to be assigned to one classroom.

The committee also noticed that there is not a clear way of marking recitation sections in the schedule. Currently recitation sections of large sections are created by creating multiple sections of a given course with each section having its own section number. The problem is that other classes, not just recitation sections, also have their own section numbers. The only real way to tell that a set of “sections” are really just one class with recitation sections is via cross-listings and to note that they meet at the same time and place. This has created some misleading cases when one recitation section is assigned to the original classroom. It looks as if an inappropriately small class has been assigned to a large classroom, when in reality it is just a recitation section using a room which would otherwise be empty. The committee recommends that some sort of flag or other method be used to denote recitation sections.

Consultant

The committee has come to the conclusion that there would be significant benefit to hiring an external consulting firm, such as Ad Astra or R25, to examine our classroom distribution and usage. The committee tried to be highly data-driven in its analysis on the issues above. One difficulty, however, is that in general data were available only for UNC Charlotte and to a limited degree from other UNC system institutions. The committee did not have access to data on schedules and efficiencies at other urban institutions. A national consulting firm would have access to such data through their own previous research projects. The committee felt it would be helpful to have one of these consultants analyze our current operations and compare it in a quantifiable manner with those of other urban institutions of similar size.

In addition, the committee's understanding is that these consulting firms are able to bring standardized metrics and data collection techniques to bear. They also have optimization software that can develop idealized schedules which could then be compared against current schedules for relative efficiency. While the committee strongly believes that the current system results in schedules that are optimized subject to the various constraints on faculty and classroom availability, it would be useful to have an outside organization examine the issue in depth.