



University of Maryland, Baltimore County



Instructional Space & Scheduling Review Study

Key Issues and Planning Directions

January 9, 2019

Educational Consulting Services Corp.
www.ecs.on.ca

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Executive Summary

Section 1 - Introduction

Purpose of Study

UMBC commissioned the *Instructional Space & Scheduling Review Study* to examine current practices, policies and outcomes related to the use and scheduling of instructional space at the main campus. Goals are to identify issues and opportunities, and frame strategies that the University can consider to strengthen scheduling and space management in support of teaching and learning excellence, developing quality schedules for students and faculty, and achieving good utilization and equitable access to the valuable instructional space resource.

This report provides a detailed description of issues and stakeholder concerns regarding scheduling and instructional space at the UMBC main campus and identifies five Planning Directions to help the University develop strategies to strengthen scheduling practices and outcomes. A companion report provides a detailed analysis of scheduled utilization of campus instructional space.

Study Process

Information and insights into the stakeholder experience of scheduling and instructional room use were gathered through consultations with more than 100 members of the UMBC community including University leadership, Deans, Chairs, Directors, Academic Scheduling Coordinators, Faculty Senate, Classroom Committee, Student Focus Group, Registrar's Office, DoIT, Facilities Management, and others. During the meetings, 79 stakeholders wrote 'on the spot' definitions of 'What is a Quality Schedule?' Twenty responses were received to a 6-question survey distributed to Chairs and Directors on scheduling practices and instructional space. Study findings were also informed by data and documentation on UMBC scheduling policies, practices and instructional rooms as well as the analysis of instructional space utilization.

Section 2 - University Context

Classrooms and teaching labs are pivotal to UMBC's strategic aim to provide an exceptional learning experience for students and innovative curriculum and pedagogy. Projected enrollment growth will place additional demand on teaching space in the future. Some mitigation of pressure will be achieved through the opening of the Interdisciplinary Life Sciences Building (ILSB) in 2019 with the provision of 16 new state-of-the-art classrooms.

Instructional space management at UMBC is supported by excellent record-keeping and analytics capacity allowing evidence-based decision-making and planning. The current committee structure overseeing instructional space management is robust and includes the Space Management Committee, Classroom Committee, Course Demand Committee and Enrollment Management Work Group.

Section 3 – Scheduling Practices and Issues

The scheduling of instructional space is a complex, mission-critical task that impacts the academic success and learning experience of students, faculty satisfaction and productivity, and the quantity of instructional space needed.

Overall, scheduling at UMBC is a successful enterprise in that courses are delivered and students are supported in completing their programs of study within designated timelines. However, many Academic Departments experience scheduling challenges that cause high levels of frustration and stress for staff and lead, in some cases, to compromised program delivery that negatively impacts students. Paradoxically, the analysis of scheduling data shows

that overall instructional space utilization on campus is low. This implies that scheduling practices, not space shortages, are impeding scheduling at UMBC.

Section 3 presents an overview of the major tasks and timeline of the current scheduling process at UMBC (p. 3-3) and identifies practices, policies and tools that may be impeding scheduling workflows and outcomes. Stakeholder quotes are provided in the report to impart the ‘flavor’ of the stakeholder experience. Highlights of the main findings are provided in the table below and are set out according to the 5 headings and 25 topics outlined in the report.

Scheduling Issues Highlights	Page
Scheduling Process	
Where Scheduling Authority Resides Scheduling authority for centrally controlled classrooms is split between the Academic Departments and the Registrar’s Office (RO). Academic Departments have authority to set the time of course delivery, section size and instructor but are dependent on the RO for room assignments. Bottlenecks develop when too many Departments request rooms for the same timeslot. Neither the RO nor the Departments have sufficient authority over scheduling parameters to easily resolve conflicts. In contrast, no major issues were highlighted by stakeholders concerning the scheduling of locally-controlled classrooms and teaching labs for which Departments have full scheduling authority.	3-4
Term Roll Using the like prior semester schedule as a starting point for scheduling (term roll) works well for stable programs and courses but disadvantages those without pre-existing timeslots on the roll-over.	3-5
Lecture Hall (LH) Scheduling The RO established the biannual LH Meeting to create a fair and transparent forum for LH room assignments recognizing that the RO lacks the tools to prioritize need for LHs. However, since demand is close to or exceeds available inventory at certain peak timeslots, many (but not all) stakeholders find the LH Meetings to be highly stressful and use graphic terms like “a game show”, “a death match” to describe the bartering process and the uncertainty around gaining access to needed rooms and timeslots. Departments report making compromises to optimal program delivery due to the challenges associated with gaining LH assignments.	3-6
Unplaced Courses after Blackout Up to 15% of courses remain unplaced after the RO has run the scheduling software optimizer for course room assignments. Academic Departments become responsible for finding rooms for unplaced courses that cannot be resolved manually by the RO. Unless placement is possible in their own locally-controlled classrooms, Departments must laboriously identify and request available RO classrooms through a portal with a 24-hour time lag, contact peer departments by phone, in person or by email to barter for rooms, and/or adjust course delivery parameters. Resolving unplaced courses is difficult, time-consuming and a major source of angst for Departments given that program delivery is at stake, and leads, in some instances, to less optimal schedules or reduced access to courses for students.	3-8
Timelines for Scheduling Meeting the various scheduling process milestone dates can be challenging for some Departments – e.g. the duration and timing of the post-Blackout period available for resolving unplaced courses.	3-10
Coordination Across Departments Lack of tools to easily share information on schedules and availability of locally-controlled classrooms among Departments increases the difficulty of certain scheduling tasks – e.g. coordinating combined sections, minimizing conflicts, finding rooms for unplaced courses.	3-13


Scheduling Issues Highlights	Page
Departmentally-controlled Classrooms There is no mechanism in place to assess and ensure that each College / School has the inventory of locally-controlled instructional space required to support its needs. Those Departments with greater reliance on RO controlled classrooms face greater scheduling challenges. It is unusual in the experience of the Consultant Team for large capacity classrooms to be locally controlled.	3-14
Other Topics Covered in Report	
Scheduling Constraints	3-12
Departmentally-controlled Teaching Labs	3-15
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Academic Advising	3-17
Scheduling Policies	
Scheduling Guidelines and Committees UMBC's 'Classroom Scheduling Principles' (2004) sets out the standard time blocks currently in use. The University recognizes that exceptions have eroded the existing guidelines over time and learning delivery has evolved such that a revisiting of scheduling principles would be prudent. A first step in this process was to commission the <i>Instructional Space & Scheduling Review Study</i> . The Consultant Team commends UMBC for having in place the Course Demand Committee and Classroom Committee to provide multi-stakeholder forums for addressing program planning and classroom inventory concerns. Stakeholders expressed a desire for transparency around the work of the Committees and the opportunity to contribute input to inform decision-making. There is also interest in the formalization of more comprehensive scheduling policies including matters such as whether courses required for majors should be given scheduling priority over 'pure' electives.	3-18
Standard Times UMBC instituted the current standard times in 2005 setting out 3 main delivery block patterns. Academics expressed strong views on how well each pattern supports pedagogy and practical needs. Mon-Wed-Fri 50-minute periods – low stakeholder support given current pedagogical practices although appropriate for introductory courses; challenged by low popularity of Fridays Tues-Thurs 75-minute periods – high stakeholder support for pedagogical reasons (e.g. sufficient time for active learning discussions); 2x/week delivery better supports student work and faculty research commitments as compared to 3x/week pattern Mon to Thurs 150-minute periods particularly 4:30 to 7PM – high stakeholder support since suitable for adjuncts and students with daytime work commitments; some unease around student attentiveness endurance and lack of student services and safety in the evenings Note that most graduate classes are held on Monday-Wednesday evenings in 75-minute blocks. Academics expressed concern around capacity to adhere to standard times – e.g. choices may be dictated by non-pedagogical factors such as availability of graduate students to teach in undergraduate labs; non-conforming program deliveries such as 4-credit programs, language programs, EHS and hybrid delivery; difficulty of scheduling classrooms at standard pattern times. Lack of congruity between start and end times for standard and non-standard delivery patterns increases the difficulty of scheduling and the number of course conflicts for students. Stakeholders suggest that the large number of exceptions may be compromising standard times and also contribute to peaks in demand for certain timeslots. Many stakeholders expressed an openness to considering changes to the established standard times, particularly a desire for more flexible options and expansion of 75-minute and 150-minute patterns. More evenly distributing demand for instructional space across the scheduling week would reduce the problems associated with peak demand timeslots and better leverage valuable instructional space during currently low-use times such as Fridays.	3-19

Scheduling Issues Highlights	Page
<p>Free Hours</p> <p>The generous allocation of three free hours per week are rigorously enforced and valued by UMBC students and staff although the common lunch hour creates overcrowding and long line-ups for food services. The University must balance benefits to the community with the fact that three hours are removed from the scheduling week during times of peak demand on instructional space. (3 hours x 127 classrooms = 381 unused instructional hours.)</p>	3-22
Scheduling Resources and Tools	
<p>Staffing for Scheduling</p> <p>With only 1.5 staff in the RO assigned to the scheduling function, there is low central capacity for dealing with high demand scheduling periods, providing support to Academic Departments during schedule development, etc. Over the past 10 years, there has been a high turnover rate of RO scheduling staff likely due to the stress of the scheduling role. The very low RO staff complement is unusual in the experience of the Consultant Team and reflects the highly decentralized scheduling model in place at UMBC.</p>	3-23
<p>Scheduling Software Tools</p> <p>UMBC's use of 'event' planning software (25Live®) rather than 'scheduling' software combined with constraints placed by current scheduling practices results in a scheduling process that requires significant manual, time consuming work by both central and departmental staff to generate workable schedules each semester.</p> <p>There are 'scheduling' software systems on the market, including Schedule 25® already licensed by UMBC, that automate and optimize scheduling to a greater degree than 25Live. User-friendly interfaces for course loading allow constraints to be specified such as prerequisites / co-requisites, delivery patterns (e.g. lecture before lab), maximum gaps between classes for students, as well as room attribute requests such as type of learning space. The capacity to describe constraints and attributes without prescriptive 'forcing' of course schedules allows scheduling software algorithms to work to build global schedules that balance the needs of all course delivery across campus and optimize schedule quality for students, faculty needs and workloads, and room and seat utilization.</p>	3-24
<p>Predicting Demand and Enrollment Growth</p> <p>With plans for sustained growth over the next decade, UMBC will continue to need to plan for expanded and new course sections and ensure course availability to support timely degree completion by students. The Course Demand Committee and Enrollment Management Work Group bring stakeholders together to support enrollment planning.</p> <p>The University does not currently have in place mechanisms or analytics to predict demand and identify pressure points that would support scheduling and room inventory management. The lack of predictive tools limits the University's ability to avoid capacity crisis situations in real time and also to understand and test the impact of potential changes to enrollment and delivery.</p>	3-25
Scheduling Outcomes	
<p>Mismatches between Learning Delivery and Room Type</p> <p>Departments report that faculty are frequently booked into rooms that are a poor fit for their pedagogical needs. UMBC's scheduling tools and processes do not utilize available activity and room attribute information that would allow for improved matching of pedagogy and room type.</p>	3-28
<p>Mismatches between Course Section Size and Room Capacity</p> <p>The <i>Utilization Analysis Report</i> and anecdotal reports by stakeholders reveal many instances where the mismatch between section size and room size is extreme such as groups of 8 students booked into large lecture theatres. These occurrences stem from the many constraints placed on the scheduling process that force schedulers to select a mismatched room since it is the only option available at the desired time.</p>	3-29

Scheduling Issues Highlights	Page
Pedagogical Consequences of Scheduling Process Challenges When classes cannot be scheduled as planned by academics, negative consequences y can accrue. The report lists examples relayed by Academics. At UMBC, inefficiencies with scheduling processes appear to be forcing Academic staff to make a higher than appropriate number of scheduling compromises that are deleterious to students and learning success.	3-31
Schedule Quality A priority of a university's scheduling enterprise should be to generate quality schedules for students that optimize learning and the university life experience. Faculty schedules should likewise meet quality and contractual standards supporting effective teaching, time for research, balanced workloads, etc. Thirdly, the global schedule should achieve efficient utilization of the valuable campus instructional space resource. UMBC does not currently have criteria or tools to measure the quality of schedules generated or recurring mechanisms to poll student and faculty satisfaction with schedules. Some insight into stakeholder priorities for scheduling quality are provided in the responses to the question 'What is a Quality Schedule?' provided by students and staff during the Study consultations. (See Appendix D.)	3-32
Other Topics Covered in Report	
Disconnect between Scheduling Challenges Experienced by Depts and Low Overall Room Utilization	3-27
Scheduling Across Campus Precincts	3-30
Campus Culture	
Culture and Customs UMBC enjoys a warm and collaborative campus community that enables inter-department cooperation and sharing of information and resources during scheduling. Stakeholders consulted expressed an openness to change going forward including active interest in better leveraging Fridays and rethinking the degree of decentralization of responsibility for scheduling.	3-33

Section 4 – Instructional Room Inventory & Issues

Instructional rooms are key to delivering UMBC's academic programs and strategic focus on innovative curriculum and pedagogy.

	Page
Instructional Room Quality and Typology	
The report lists stakeholder comments on existing classroom quality, typology and maintenance that may be useful to the University's ongoing efforts to manage its instructional inventory and develop and implement multi-year plans to refresh and improve the centrally-controlled classroom pool.	4-1
Instructional Room Preferences of Students	
During the Student Focus Group meeting, a range of different classroom furniture types and configurations were discussed using a handout with descriptions and images of exemplar rooms. Among this small sample group of students, there was unanimous dislike of traditional style classrooms furnished with tablet arm chairs, and strong preference for all types of collaboration and active learning type classrooms (exemplar image below). Positive comments were made about UMBC's existing active learning classrooms – e.g. CASTLE.	4-3
	

	Page
Instructional Room Utilization Analysis Results Summary	
This section summarizes the detailed assessment of current teaching space utilization at UMBC in the <i>Utilization Analysis Report, January 9, 2019</i> . The analysis demonstrates that UMBC's main campus has sufficient instructional room inventory to meet academic delivery needs. The primary pressure point is the supply of large teaching spaces which will be addressed through the provision of new classrooms in the ILSB.	4-4

Section 5 – Planning Directions

The Consultant Team has articulated five Planning Directions for consideration by UMBC that address the issues identified during the Study and can help the University formulate strategies and select tools to strengthen scheduling processes and outcomes at UMBC. Appendix E provides additional information on each topic including options, potential next steps, exemplars, etc. to support the University's analysis and review work.

It is important to note that planning changes to the scheduling enterprise must account for its mission critical status, complexity and many interconnected elements. Careful design, testing and implementation of improvements will likely take 2 to 3 years.

Planning Direction A - Investigate Scheduling Authority Model Options		Page
Issue	<ul style="list-style-type: none"> For centrally-controlled classrooms, responsibility for room assignments, time of delivery and section size is split between the RO and Academic Departments resulting in a high number of unplaced courses which neither side can easily resolve. Department staff become responsible for finding rooms for unplaced courses and face high stress, tight timelines and inadequate tools. It is understood that academic stakeholders hold strong views around maintaining scheduling authority and oversight of local teaching space. However, the scheduling challenges faced by the University because of the hybrid model now in place point to the need to review options to determine if alternative approaches might be beneficial. It is emphasized that the intent is not to take space away from Academic Departments. 	5-4
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Review the merits of different scheduling models that can reduce the constraints that are currently hindering efficient and effective scheduling. Models / strategies for investigation can include, for example: <ul style="list-style-type: none"> <u>Fully decentralized</u> - Colleges/Schools assigned local control over the full inventory of teaching space required to deliver their programs and activities based on verified analysis of need <u>Shared decentralized</u> - Colleges/Schools have priority use of certain teaching spaces with mechanisms/tools in place that allow use by other academic units once priority college/school needs have been met <u>Status quo adjusted</u> - Colleges/Schools retain local control of teaching labs and low capacity classrooms while RO controls scheduling of large classrooms and lecture halls. Key change is that Departments provide the RO with detailed information on course delivery attributes - pattern of delivery, room typology, section size, etc. instead of exact time of delivery, specific room number, etc. University's new course scheduling software generates schedules that achieve Department goals for delivery and balance competing demands for high capacity classroom space. <u>Centralized</u> - All teaching space is scheduled centrally with new scheduling software enabling Departments to achieve desired delivery goals through the specification of a full range of delivery attributes 	

Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Improved scheduling success – e.g. elimination of unplaced courses, minimization of course conflicts, no need for LH meeting, optimization of schedule quality for students and faculty, improved room utilization, etc. 	
Inter-dependencies	<ul style="list-style-type: none"> Scheduling practices and timelines, RO staffing 	

Planning Direction B - Review Scheduling Policies, Processes, Timelines and Staffing Levels		Page
Issue	<ul style="list-style-type: none"> Current UMBC scheduling policies are not comprehensive. The Study has revealed challenges facing scheduling processes and timelines that warrant review and adjustment. 	5-6
Areas for Exploration by UMBC	<ul style="list-style-type: none"> <u>Revise/ expand UMBC scheduling policies.</u> Consider, for example: mission statement, quality objectives for student schedules and faculty schedules, standard time patterns, policies around scheduling priorities and allowable constraints, instructional space utilization targets, etc. <u>Review scheduling timelines</u> collaboratively with academic stakeholders to optimize scheduling task durations and deadlines, meet registration targets for students, and minimize changes after student schedules are published. <u>Review staffing levels</u> to ensure adequate resources are in place to support the vital scheduling enterprise. <u>Consider mechanisms to collect information on scheduling quality</u> outcomes, student and faculty priorities to inform scheduling planning and practices. 	
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> More effective and efficient scheduling process, reduced staff workloads and stress, enhanced quality schedules and student access to courses. 	
Inter-dependencies	<ul style="list-style-type: none"> Planning Directions A - D 	

Planning Direction C - Review Options to Enhance Flexibility within the Standard Time Grid		Page
Issue	<ul style="list-style-type: none"> It is timely for the University to review its standard time framework in light of changes since 2005 such as evolving learning delivery modes and patterns, pressure points within existing grid, etc. 	5-3
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Research standard time models in use at peer universities Understand priorities of the UMBC academic community for patterns of course delivery that optimize learning and student success Understand student preferences for course delivery and quality schedules Explore alternate free hour models that reduce the number of free hours and/or their time-of-day and scope (e.g. institution-wide/college specific) Consider ways the weekly scheduling grid can be structured to accommodate standard times. E.g. An hourly scheduling grid can support 1, 2 or 3 period delivery patterns at any time of day 	
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Increase flexibility in the delivery of 50, 75 and 150-minute periods with particular attention on expanding options for 75 and 150-minute periods Tamp down peak demand by distributing delivery across the week Enhance conflict-free access to general education and elective courses Lessen disadvantage for programs and courses that do not conform to established standard times Promote improved room utilization on Fridays and early mornings Support continued strong utilization of late afternoon/early evening timeslots 	

Planning Direction D - Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements		Page
Issue	<ul style="list-style-type: none"> UMBC has multi-year plans to upgrade instructional room quality; Colleges have developed innovation teaching spaces such as CASTLE and CALC; the new ILSB will provide state-of-the-art new teaching space. Since the current scheduling system does not allow specification of room typology during course loading, faculty are often scheduled into rooms that do not support intended pedagogy. There is a paradox between the room shortages experienced by academics during scheduling and the low overall rates of utilization of the instructional room pool revealed by utilization analyses. 	5-5
Areas for Exploration by UMBC	<ul style="list-style-type: none"> <u>Match instructional room inventory to pedagogies</u> – Develop recurring processes involving academic stakeholders (faculty, students, FDC) to assess ‘ideal’ teaching spaces that support best practice learning delivery and innovative pedagogies. Integrate recommendations into multi-year plans for upgrading of classroom pool. Course scheduling software will allow Academics to request specific room typologies during course loading leading to room assignments that better match desired learning delivery modes. <u>Right-size the instructional room inventory</u> – Develop data-driven analysis tools to assess/predict demand for instructional space. Use this information to drive ongoing assessment and adjustment of classroom inventory to match demand in terms of number of rooms and seat capacity. <u>Develop mechanisms and/or identify tools to more easily share information</u> on the availability of instructional space among RO, Academic Departments and other stakeholders. 	
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Better matching of learning delivery modes to classrooms, supporting quality teaching and learning, and innovation in pedagogy. Better matching of section sizes to room capacities If scheduling issues can be successfully addressed, the University will be positioned to realize latent capacity in the instructional space inventory. This can include repurposing some rooms to, for example, create departmental collaboration or research space. 	
Inter-dependencies	<ul style="list-style-type: none"> Improved scheduling software, scheduling practices, timelines, staffing 	

Planning Direction E - Research Scheduling Software Systems		Page
Issue	<ul style="list-style-type: none"> UMBC uses 25Live® Event Planning software by CollegeNet which is not purpose-designed for course scheduling and lacks the full scope of options, algorithmic power and user-friendly interfaces of dedicated course scheduling software. 	5-2
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Research the attributes of scheduling enterprise software systems, particularly Schedule 25 by CollegeNet which UMBC already licences, to understand the advantages to UMBC of available course scheduling software options. 	
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Improve scheduling success – e.g. potential elimination of unplaced courses, minimization of course conflicts, optimization of schedule quality for students and faculty, improved room utilization Improve utility of course loading interfaces through capacity to define a broad range of course delivery parameters allowing software algorithm to prioritize and balance needs across all academic activities Ability to encode room attributes and match to pedagogy Reduce manual labor required throughout scheduling process No need for term roll, improving equity of access to space No need for lecture hall meeting Improve match between course section size and room capacity Ability to prioritize campus precinct in room location assignments Improve access to information on schedules and available rooms Predictive and post-scheduling analytics capacity 	
Inter-dependencies	Even the most powerful scheduling software cannot ‘do its job’ if the constraints placed by course loading are so restrictive that the algorithm cannot function as designed. Changes resulting from the following planning directions will impact the efficacy of any new scheduling software at UMBC: scheduling model, particularly authority for specifying time of course delivery; standard times; scheduling practices and timelines; RO staffing	

Section 1

Introduction

Study Goals and Objectives

The University of Maryland, Baltimore County (UMBC) commissioned an Instructional Space & Scheduling Review Study to review current practices, policies and outcomes regarding the use and scheduling of instructional space at the main campus. Goals were to identify issues and opportunities, and frame strategies that the University can consider to strengthen scheduling and space management in support of teaching and learning excellence, developing quality schedules for students and faculty, and achieving good utilization and equitable access to the valuable instructional space resource.

Study Process

The Study was overseen by a **Project Steering Committee**. The University's Work Group on Class Scheduling Guidelines served as an **Advisory Group** on the project.

The Study focused on gathering broad stakeholder input through several formats:

- **Stakeholder consultations** - to gather information, experiences and perspectives on scheduling and instructional space use. Eighteen meetings were held with more than 100 UMBC stakeholders in April and May 2018 with participation from University leadership, Deans, Chairs, Directors, Academic Scheduling Coordinators, Faculty Senate, Classroom Committee, Student Focus Group with SGA and GSA representatives, Registrar's Office scheduling staff, DoIT, Facilities Management, and others. An addition meeting with Faculty Senate was held on November 5, 2018. Appendix B provides a list of meetings and participants.

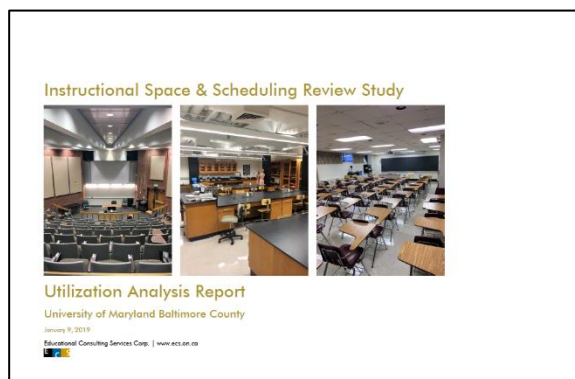


- **Questionnaire** - to collect information and opinions on the development of schedules by academic departments and the quality, quantity and types of instructional spaces. A 6-question survey was distributed to Chairs and Directors in May 2018 and 20 questionnaires representing a broad span of colleges, schools and programs were completed by stakeholders. Appendix C provides a listing of the survey questions.
- **Stakeholder Definition of a Quality Schedule** – to collect a snapshot of the UMBC community's priority criteria for quality schedules, during the consultations, all meeting participants, whether students, faculty, administrators or senior leaders, were asked to write down, on the spot, their 'best' answer to the question: *What is a Quality Schedule?* Appendix D records all responses provided.

Reports

This **Key Issues and Planning Directions Report** synthesizes the information gathered through consultations and data analysis and defines constraints on scheduling and space use at the main campus and outlines options for enhancing processes and outcomes. An Interim Report was issued in July and reviewed by the Project Steering Committee. An updated Report was issued in October, 2018 for review by campus stakeholders including Faculty Senate with the final report issued January 9, 2019.

A **Utilization Analysis Report**, issued on May 9, 2018 provided a quantitative assessment of the utilization of all classrooms and teaching laboratories at the UMBC main campus. Following adjustment of inventory data by UMBC, the report was updated and reissued January 9, 2019.



Consultant Team

UMBC retained Educational Consulting Services Corp. (ECS) to undertake the study. ECS provides specialized facilities planning services to higher education institutions to develop buildings, campuses, policies and planning tools that foster quality teaching, learning, research and student life.

Project Steering Committee

Philip Rous	Provost and Senior Vice President, Academic Affairs
Lynne Schaefer	Vice President, Administration & Finance
Keith Bowman	Dean, College of Engineering & Information Technology
Scott Casper	Dean, College of Arts, Humanities & Social Sciences
Katherine Cole	Vice Provost and Dean, Undergraduate Academic Affairs
Bill LaCourse	Dean, College of Natural and Mathematical Sciences
Janet Rutledge	Vice Provost and Dean of the Graduate School

Project Advisory Group Work Group on Class Scheduling Guidelines

Antonio Moreira	Vice Provost for Academic Affairs
Pam Hawley	University Registrar
Richard Chang	Associate Professor, Computer Science and Electrical Engineering
Dennis Cuddy	Manager, Administration and Facilities, Chemistry and Biochemistry
Paul Dillon	Assistant Director, UMBC Police
Michael Glasser	Director of Decision Support, IRADS
Doug Lamdin	Professor, Economics
Edyta Edwards	Specialist, Summer, Winter and Special Programs
Yvette Mozie-Ross	Vice Provost, Enrollment Management & Planning
Elaine O'Heir	Department Coordinator, Psychology
Julianne Simpson	Director of Planning
Jack Suess	Vice President of Information Technology
Drema Wentz	Associate Registrar, Catalog, Scheduling & Faculty Services

Note:

In this report, the term 'department' is used to refer to all academic units making scheduling decisions whether part of a college, school or other academic unit.

Message from Consultant Team

ECS sincerely thanks all stakeholders for their participation and candid opinions offered during the consultations, completion of the survey, and responses to the quality schedule question.

This report focuses on challenges and shortcomings with current practices. It should be noted that there are some Academic Departments, particularly those with sufficient locally-controlled classrooms or those that deliver courses outside of peak hours, for whom current practices are not problematic.

The Consultant Team found that the UMBC community recognizes the challenges inherent in scheduling and managing campus instructional space equitably and effectively. Stakeholders provided information and their experiences and perspectives in a spirit of collegiality and goodwill with the intent of being forthright on difficult topics in order to best support a process leading to positive change.

Section 2

University Context

Context for Instructional Space Analysis Study

The Instructional Space & Scheduling Review Study is being carried out within the framework of the campus-specific conditions at UMBC and the broader higher education landscape. This section outlines some of these context elements that are important to consider as the analysis and planning work progresses.

UMBC Strategic Plan

Classrooms and teaching labs are pivotal to UMBC's strategic aim to provide an exceptional learning experience for students and innovative curriculum and pedagogy.

Our UMBC, A Strategic Plan for Advancing Excellence (2017)

Focus Area – The Student Experience

Create vibrant, exceptional, and comprehensive undergraduate and graduate student experiences that integrate in- and out-of-classroom learning to prepare graduates for meaningful careers and civic and personal lives.

Focus Area – Collective Impact in Research, Scholarship and the Creative Achievement

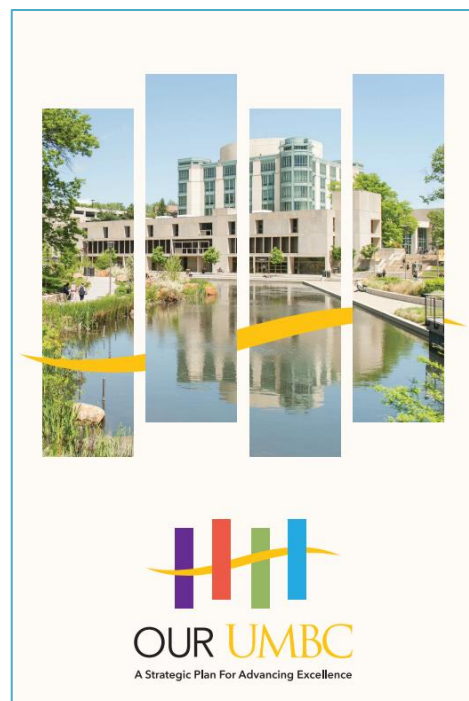
Elevate UMBC as a nationally and internationally recognized research university strongly connected with the economic and civic life of the Baltimore region and the State of Maryland. The key drivers in achieving this goal are: creating an inclusive environment for faculty, students, and staff; developing excellence in new intellectual frontiers; and fostering multidisciplinary and inter-institutional approaches that build research across the campus

Focus Area – Innovative Curriculum and Pedagogy

Develop innovative curricula and academic programs that support and enhance the success of our undergraduate and graduate students and prepare them for meaningful careers, lifelong learning, and engaged citizenship; and thereby enhance our position as a national leader in undergraduate and graduate education.

Focus Area – Community and Extended Connections

To build, nurture, and extend connections with diverse internal and external partners to enrich campus life, local neighborhoods, the state, and the surrounding region. To foster innovative problem-solving and responsible entrepreneurship through strategic partnerships with alumni, government agencies, businesses, and community-based organizations to create a sustainable and prosperous future for all.



UMBC – Academic Profile

Academic Divisions

- College of Arts, Humanities and Social Sciences
- College of Engineering & Information Technology
- College of Natural and Mathematical Sciences
- The Erickson School
- Graduate School
- School of Public Policy (established in 2014)
- School of Social Work

Undergraduate Program Profile – Fall 2017 (All Campuses)

Program Offerings	<ul style="list-style-type: none"> • 57 Majors • 37 Minors • 31 Undergraduate Certificates • STEM disciplines comprise: 57% of all undergraduate enrollment and 45.4% of UMBC bachelor's degree recipients, highest of any other public Maryland institution
Enrollment	<ul style="list-style-type: none"> • 11,234 total undergraduate headcount • ↑ of 18.7% over 10 years (2007 – 2017)
Credit Hours	<ul style="list-style-type: none"> • 152,193 credit hours delivered • ↑ of 18.8% over 10 years (2007 – 2017)

Graduate Program Profile – Fall 2017 (All Campuses)

Program Offerings	<ul style="list-style-type: none"> • 43 Master's degrees • 24 Doctoral degrees • 34 Graduate Certificates
Enrollment	<ul style="list-style-type: none"> • 2,428 total graduate student headcount • ↓ 5.8% over 10 years (2007 – 2017)
Credit Hours	<ul style="list-style-type: none"> • 15,225 credit hours delivered • ↑ 16.7% over 10 years (2007 – 2017)

Faculty and Staff – Fall 2017 (All Campuses)

Academic Faculty and Staff	<ul style="list-style-type: none"> • 697 full-time faculty • 322 part-time faculty • 596 graduate research assistants
Faculty : Student Ratio	<ul style="list-style-type: none"> • 18:1

Enrollment Growth

UMBC projects continued enrollment growth. The University expects that declining demographics will be offset by the University's strong national reputation for undergraduate education. The historic success of UMBC's men's basketball team in the 2018 NCAA tournament is also expected to contribute to admissions interest!

As shown in the table, over the next 10 years, the University projects growth of 13.3% growth from 13,662 to 15,481 headcount students split as 80% undergraduate / 20% graduate enrollment.

	Actual 2017	Projected 2027	# of Additional Students	Percent Change over 10 Years
Headcount Total	13,662	15,481	1,819	13.3%
Undergraduate Total	11,234	12,397	1,163	10.4%
Full-time	9,543	10,490	947	9.9%
Part-time	1,691	1,907	216	12.8%
Grad./First Prof. Total	2,428	3,084	656	27.0%
Full-time	1,126	1,166	40	3.5%
Part-time	1,302	1,918	616	47.3%
FTDE or FTNE Students	9,801	11,012	1,212	12.4%

Data provided by UMBC IRADS based on Fall 2017 student data for all campuses. Approximately 94% of all activity takes place on the Main Campus with the remainder delivered at Shady Grove Campus or off-site. FTDE or FTNE figures describe enrollment in full time day and night equivalency respectively, a measure that is useful for institutional planning and benchmarking analyses. FTDE spans 8am to 5pm.

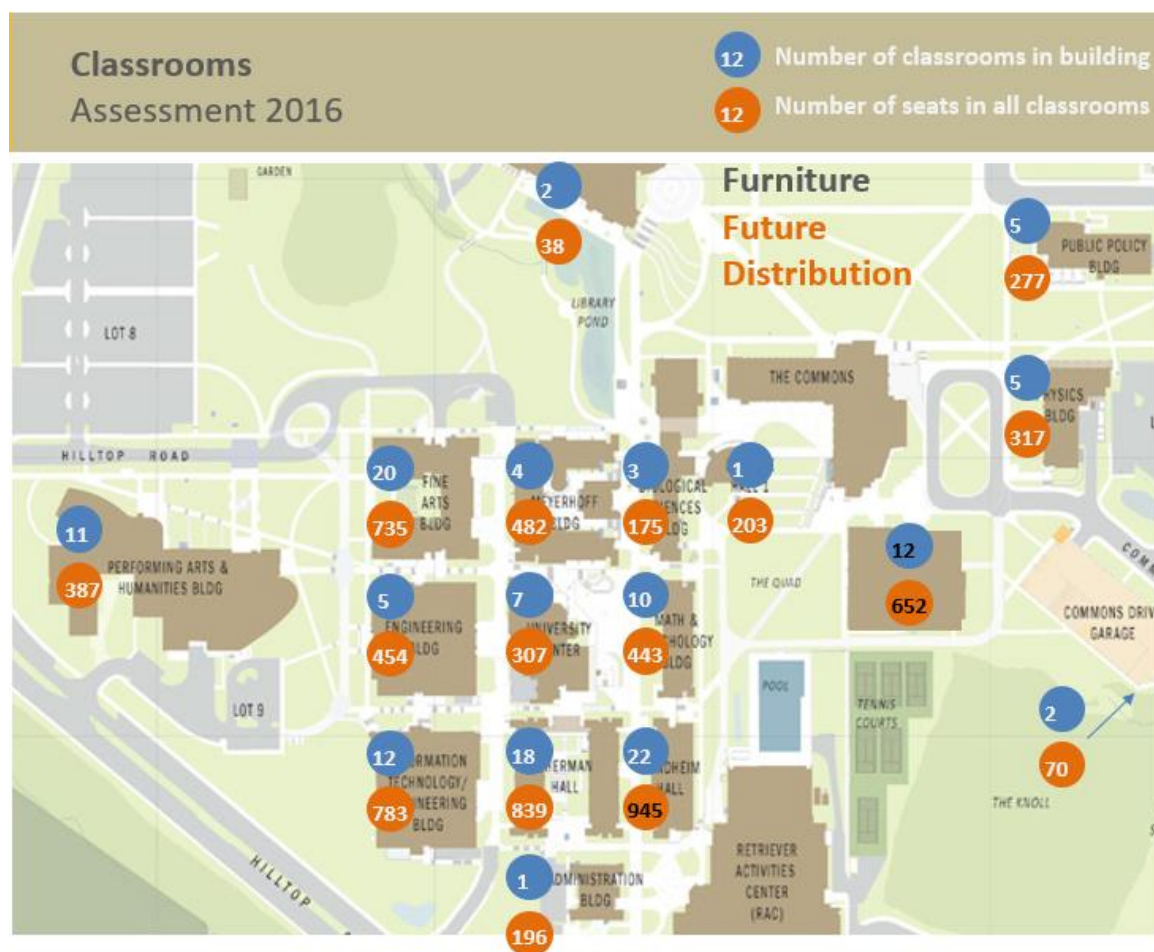
The 2018 UMBC Facilities Master Plan bases campus site and facilities planning on a long-term future enrollment for the University of 18,000 students (timeline for this benchmark not set).

Enrollment growth will place additional demand on the classroom and teaching laboratory pool as well as on learner support, student and ancillary services particularly as the University does not plan to significantly grow its online delivery. Additional enrollment can be absorbed by increasing the size of existing course sections and/or adding sections to existing or new course offerings.

UMBC - Classroom and Teaching Laboratory Inventory

Existing Inventory

- 127 classrooms
 - 82 scheduled by the Office of the Registrar
 - 45 scheduled locally by departments
 - 12 future in new ILSB
- 71 teaching laboratories, all scheduled locally by departments



Graphic provided by UMBC

Instructional Space Utilization

As part of the Instructional Space & Scheduling Review Study, a *Utilization Analysis Report* dated January 9, 2019 provides an assessment of use of classrooms and teaching labs at the UMBC main campus including:

- **Classroom Inventory Overview** – allocations and comparison to recommended station area benchmarks
- **Classroom Utilization Analysis** – utilization rates by room capacity range for central and local-controlled classrooms; time of day use profiles; seat utilization and optimal classroom pool
- **Teaching Laboratory Utilization Analysis**

Future Plans Affecting Instructional Room Inventory

The new 70,000 NASF/ 130,000 GSF Interdisciplinary Life Sciences Building (ILSB) will open in Fall 2019:

- 60% research space / 40% instructional space
- 12 classrooms/652 seats:
 - 4 large seminar rooms @ 24 seats
 - 4 medium active learning classrooms @ 48 seats
 - 4 large active learning lecture rooms @ 2 x 90 seats + 2 x 92 seats
- 4 STEM teaching labs
- 6 collaborative project rooms
- Interdisciplinary research labs, support facilities and collaboration areas



UMBC – Instructional Space Management

Instructional Space Management at UMBC¹

Over the past ten years, UMBC has made progress to more effectively utilize and manage all space including instructional space. Some specific developments include:

- **UMBC Space Management Policy (UMBC Policy #VI-4.10.02)**
Outlines specific responsibilities and processes focused on tracking, assignment, and utilization of space. Accompanying guidelines include:
UMBC Procedure for Space Requests
UMBC Office Space Guidelines
- **Space Management Committee**
Reviews all space requests that are outside the authority of the Deans and Vice Presidents.
- **Classroom Committee**
 - Reviews classroom scheduling practices and provides recommendations on scheduling policies and practices leading to more efficient use of the classrooms and lecture halls
 - Provides recommendations for increased utilization of Friday afternoons for scheduling in order to improve campus climate
 - Provides oversight of the classroom upgrades/maintenance needs on the campus
 - Provides a forum to discuss the size of classrooms mostly needed
 - Meets on a monthly basis during the academic year
- **Course Demand Committee**
Work with Department Chairs and Deans to monitor course availability for both Fall and Spring semesters and address any challenges by approving the opening / expanding of course sections
- **Enrollment Management Work Group**
Monitors enrollment data, assess/analyze enrollment trends, and develop and implement strategies to meet institutional enrollment goals
- **Facilities Management (FM)** maintains a **space database** within PeopleSoft that describes the amount, type, capacity, and assignment of each room. The database includes fields for occupant name, indirect cost recovery categories of use, room features, classroom seat type, and AV equipment
- **Institutional Research, Analysis & Decision Support (IRADS)** collects and analyzes data and records to support ongoing campus planning and decision-making. This includes enrollments and campus room inventory and allocations.
- IRADS and Facilities Management (FM) **assess classroom utilization** based upon compliance with the campus's scheduling guidelines and utilization targets
- Division of Information Technology (DoIT), IRADS, and FM are partnering to advance **data analytics** by leveraging space and campus activity data. **REX** is the reporting and decision support environment for UMBC's data warehouse. The data warehouse integrates data from systems throughout the University. REX allows authorized faculty, staff, and institutional researchers to report and analyze University data.

¹ Portions of the text are extracted from the Project Request for Proposals.

In the experience of the Consultant Team, UMBC is exceptional in maintaining records and data that provide a strong foundation for conducting the analytics that support evidence-based planning and decision-making.

Evolving Post-Secondary Landscape

Universities and colleges across the US and elsewhere are responding to factors that are driving change in learning delivery, learner support and the campus life experience.

- **Technology and cultural change** have driven an evolution in the needs and expectations of 21st Century learners. UMBC and many other institutions are responding by measures such as:
 - Introducing new types of learning environments that support a range of delivery modes particularly active learning settings that enable inquiry-based learning activities and collaborative group work - e.g. CNMS's CASTLE, Science Learning Collaboratory, Chemistry Discovery Center



- Integrating participation in applied learning and research as part of the undergraduate experience
- Increasing the use of technology tools for course delivery and management
- Enhancing supports for faculty to promote excellence in teaching. At UMBC, the Faculty Development Center (FDC) coordinates with the Office of the Provost and DoIT, to provide a range of services to faculty for pedagogical support and innovation
- Ensuring ubiquitous wireless connectivity across campus and access to power for mobile devices including in learning environments
- Recognizing the importance of informal spaces outside of the classroom, lab and library for study, group work, socializing, innovation – the 'learn anywhere/anytime' campus

- **Increasing diversity of the student population** including more minority students and students from different backgrounds, first generation students, transfer students, mature students, students who need or want to work, those with family commitments, etc. The spectrum of needs includes:
 - Increasing demand from students for more flexible delivery patterns including delivery outside of the traditional daytime periods, online options, etc.
 - Need for the provision of a wider range of supports – learner support, advising, etc.

In response to changing student needs and expectations, many universities, colleges and schools are transitioning from operating as 'teaching institutions' to serving as 'learning organizations'. This involves a shift in ethos from 'this is what we offer' to 'what can we do to help you learn?'. Learning organizations are committed to continuous improvement and adaptability.

Section 3

Scheduling Practices & Issues

Introduction

The scheduling of instructional space in post-secondary institutions is a complex, mission-critical task that impacts the academic success and learning experience of students, faculty satisfaction and productivity, and the quantity of instructional space needed, a valuable and costly resource. Scheduling involves a multi-step, multi-stakeholder and time-sensitive process to define and verify course delivery information and schedule hundreds of discrete classes and events across all academic units.

This section reviews UMBC's existing scheduling practices and highlights issues revealed during the consultations and analysis that may be impeding scheduling workflows and outcomes.

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Note: Quotes of stakeholders (some paraphrased) are shown in highlighted italics throughout this section to convey information and also the 'flavor' of the stakeholder experience.

Scheduling Process**UMBC Scheduling Process Overview****Responsibility for Scheduling by Semester**

At UMBC, scheduling is carried out for four academic semesters:

January	February	March	April	May	June	July	August	September	October	November	December
WINTER	SPRING					SUMMER			FALL		

The Registrar's Office (RO) and Academic Departments collaborate to schedule courses for the Spring and Fall semesters. The Office of Summer, Winter & Special Programs and Academic Departments collaborate to schedule courses and events offered during the Summer and Winter sessions.

This report focuses on scheduling for the Fall and Spring, terms of peak academic activity that drive demand for campus instructional space.

Description of Scheduling Process

Although most UMBC programs have a well-defined 4-year pathway, the University uses a course-based delivery model whereby every student has a customized schedule. It is the responsibility of the Academic Departments and the Course Demand Committee to ensure that courses required for program completion are available so that students can graduate within the timeframe specified for their program of study.

UMBC has a well-defined scheduling process overseen by the RO which provides information and training sessions to academic schedulers. The graphic on the following page describes the process and timelines for developing the schedule for the Fall semester using 2017 dates as an exemplar. Critical dates for Summer and Spring semesters for 2017 are shown in the right-hand column illustrating how those responsible for scheduling must address multiple semesters concurrently.

Scheduling Tasks and Timelines for Sample Semester – Summer / Fall 2017

Month		Day	Fall 2017 Critical Path		Other Semester Critical Dates
			Registrar's Office Actions	Department Actions	
January 2017			Term Roll <ul style="list-style-type: none">• RO rolls over like semester data for all active courses omitting instructor and room assignments• Large room, lecture hall data re-entered manually after roll	<ul style="list-style-type: none">• Attend Scheduling Open Houses• Attend Scheduling Coordinator meetings	
		30			Summer 2017 Schedule Go Live
February 2017			Scheduling Activities by RO <ul style="list-style-type: none">• Build combined section table and coordinate review by depts• Offer training and work sessions• Receive computer lab requests, monitor issues• Monitor / work to adjust incorrect class associations• Add new instructor data• Work with special populations on scheduling (PHED, DPS, Castle, Erickson, etc.)• Troubleshoot, provide support	Schedule Development by Depts <ul style="list-style-type: none">• Build departmental schedules• Adjust, if necessary, rolled over delivery attributes – section size, new sections, instructor if known, room # if dept-controlled, etc.• Attend (Scheduling Coordinators) Lecture Hall meeting facilitated by RO to barter for large classroom and lecture hall rooms/times using term roll as starting point	
		10	Lecture Hall Meeting		
		17			Spring 2017 Common Final Meeting
		20	Fall edits & combined / cross-listed course requests due		
		22	Fall Blackout Begins		
March 2017			Blackout <ul style="list-style-type: none">• Consult depts on hybrid courses• Assign rooms for accessibility requests, computer lab requests• Make sure online courses not assigned rooms• Finalize any class association adjustments• Remove any centrally-controlled rooms assigned (other than accessibility/ computer lab/LH)• Ensure scheduling for depts with non-standard locations / enrollment issues are completed (Erickson, Castle, EHS, etc.)• Run optimizer in 25Live• Make adjustments and assign spaces to as many unplaced classes as possible• Distribute list of unplaced courses to depts	Blackout <ul style="list-style-type: none">• Depts can view but not change schedule	Summer 2017 Registration
		6			
		20	Blackout Ends		
		27	Fall Schedule Go Live		
April 2017			Fall Advanced Registration Begins	<ul style="list-style-type: none">• Schedules verified by Scheduling Coordinators. Can make changes but if they impact capacity must submit a ticket (RT)• Receive listing of unplaced classes. Depts responsible for finding solution which can include:<ul style="list-style-type: none">• assign dept space• use REX report to review and request available room by RT at preferred time• barter with other depts to swap or use rooms (generally by phone)• change class time to secure available room	
		3			
		24	Fall General Registration Begins		
</					

Scheduling Process

Where Scheduling Authority Resides

Role of RO and Academic Departments

Scheduling hinges on a determination of the time, section size and room assignment for each course delivery event. The designation of who is responsible for each of these elements defines whether an institution has a centralized, decentralized or hybrid scheduling model. At UMBC, authority for scheduling varies by type of instructional space.

The **Registrar's Office** manages the overall scheduling function and provides support to the Academic Departments during the scheduling process by providing training and resources. In terms of scheduling authority, the only element controlled by the RO is the determination of room assignments for centrally controlled classrooms.

Academic Departments develop course schedules for the programs and courses they deliver. They have complete control over the scheduling of locally-controlled classrooms and teaching laboratories and authority to specify the day/time of delivery and section size for events scheduled in centrally-controlled classrooms.

Instructional Space Type	RO has authority for:	Academic Departments have authority for:	Scheduling Model
Centrally controlled classrooms	<ul style="list-style-type: none"> Room assignment 	<ul style="list-style-type: none"> Time of course delivery event Section size Instructor 	Hybrid
Locally controlled classrooms	-	<ul style="list-style-type: none"> Time of course delivery event Section size Room assignment Instructor 	Decentralized
Teaching laboratories	-	<ul style="list-style-type: none"> Time of course delivery event Section size Room assignment Instructor 	Decentralized

Issues and Comments

- A fully decentralized or centralized scheduling system provides one entity with full scheduling authority and the latitude to address needs without the constraint of another scheduling authority driving a component of the schedule. Unsurprisingly, no major issues were reported to the Consultant Team concerning the scheduling by Departments of locally-controlled classrooms and teaching laboratories.
- In contrast and as described throughout this section, many issues are challenging the scheduling of centrally-controlled classrooms at UMBC. For these instructional spaces, authority for scheduling is shared between the RO and the Academic Departments and therefore operates as a hybrid scheduling model.

The RO is responsible for room assignments for course events at times set by the Academic Departments. For a particular timeslot, when requests from the Academic Departments exceed the available number of centrally controlled classrooms of a desired capacity, the RO does not have authority over other scheduling parameters to develop a solution by, for example, scheduling the event one hour earlier or later when rooms may be available. Responsibility then falls back to the Academic Departments to solve the problem of unplaced courses by scheduling or bartering for a centrally or locally-controlled classroom or changing course delivery parameters. Under this hybrid model, neither the RO nor the Academic Departments have the authority to easily resolve scheduling conflicts.

Scheduling Process**Term Roll**

To initiate the scheduling process, the RO rolls over the schedule of the previous like semester. For programs that are unchanged from year to year, the roll-over maintains the exact pattern and time of delivery.

Rolled:	Not rolled:
<ul style="list-style-type: none"> • Time of delivery • Only room attributes of Accessibility, Smart, Computer 	<ul style="list-style-type: none"> • Instructor • Instructional room assignment

Issues and Comments

- Term roll works well for courses that do not tend to change from year to year such as large service courses for freshmen.
- Departments with stable year-to-year program offerings find scheduling “fairly simple” as the term roll allows them to easily make minor adjustments each new term
- In contrast, term roll disadvantages Departments / programs / new programs without pre-existing timeslots on the roll-over
- Some Departments with established term-roll timeslots are concerned they may face challenges in the future as growth leads to the need for new sections
- Over time, with the term roll tending to remain static while programs and enrollments evolve, this practice is likely tamping down year-to-year program plan changes / innovations since, for reasons described elsewhere in this section, academics are reluctant to make changes to established schedule elements. For the same reason, the term roll may also be hindering optimization of scheduling quality outcomes.

Scheduling Process

Lecture Hall Scheduling

Large classrooms and lecture halls (referred to here as “LH”) are assigned during the biannual ‘Lecture Hall Meeting’ held each year in February for the Fall semester and in September for the Spring semester. Each meeting is facilitated by the RO and attended by Scheduling Coordinators or other designated representatives from all departments requiring LH delivery for their courses. At the meeting, starting with the rolled-over schedule for LHs from the prior like semester, Departments barter for room assignments.

Issues and Comments

- Most (but not all) stakeholders find the LH meeting to be highly stressful and challenging. The following quotes (some paraphrased) from the consultations capture the intensity of the experience for many:

“It is like a game show – you must react fastest when your preferred timeslot comes up.”

“It all depends on your savvy. We lost our scheduling person and now only have a novice fighting in our corner so our chances of getting room assignments are low.”

“It is like the Hunger Games.”

“It is a Death Match – you need to be first on the buzzer, you need to shout out - that is my room.”

“My Coordinator brings a colleague for moral support to deal with the stress.”

“The Lecture Hall meeting is ludicrous. The process lends itself to inefficiency.”

“It seems like it depends on the personality of the scheduler, whoever can be most persuasive.”

- Great concern that if a Scheduling Coordinator / Department representative happens to be away or accidentally misses the meeting, that Department will not obtain LH assignments with no recourse thereafter.
- Departments who have ‘set’ LH assignments that are rolled over from year-to-year feel they cannot ‘give up’ their timeslots for fear of never regaining access even if their needs have changed. More than one Department described relinquishing a LH timeslot in the past and being unable to regain access in subsequent years.
- Departments without established timeslots in the roll-over and those with variable year-to-year course deliveries are at a disadvantage in gaining access to LH room assignments.
- At least one Department reported deliberately not planning large sections even though such delivery is preferred because they do not wish to deal with the challenges of the LH meeting and are too concerned about the risk of not gaining room assignments needed.
- Experience relayed of requiring a LH twice a week for course delivery yet only being able to gain a room assignment for one day a week, this for a course with a substantial wait list.
- If the meeting moderator makes an error, “huge scheduling snafus” ensue.
- No flexibility for a Department to change the day or time of class after the room assignment is given even if the instructor becomes unavailable.
- Seating capacity is not considered or discussed as room assignments are made.
- Lecture halls not claimed at the LH meeting are placed in the pool of available classrooms and then assigned to courses that have lower enrollment caps. These rooms are generally not released during the next like semester roll-over resulting in a continuation of the mismatch in capacity to section size and reduced LH availability for large section courses.

- One stakeholder group suggests that advocacy at LH meetings be by College rather than Department to aid in the prioritization of access to rooms.
- The biannual LH meeting was initiated by the RO to create a fair and transparent forum and process for LH room assignments recognizing that the RO lacks the information and tools to prioritize need for the limited and valuable LH resource. However, this is not the experience of many stakeholders given that demand is exceeding available inventory at certain peak timeslots. The addition of four new large capacity teaching spaces in the new ILSB in 2019 will help to alleviate this situation.

Scheduling Process

Unplaced Courses after Blackout

According to the RO, following Blackout and running of the scheduling software optimizer, on average 200 - 300 courses out of 2,000 are unplaced with no room assignment. The RO manually assigns rooms to as many courses as possible and then compiles a list of remaining unplaced courses that is distributed to the Departments. Individual Departments become responsible for solving the unplaced course problem. Options for finding room assignments include:

- place the course in a locally-controlled classroom, if available
- use the REX report to review classrooms available at the preferred time; issue a request for assignment by RT
- contact and barter with other Departments to swap or use available classrooms
- change the class time to secure an available room

Issues and Comments

- The system was described by some as a lottery in that Academic Departments do not know until the Blackout period is completed whether their courses will achieve room assignments. The tongue-in-cheek termed 'Loser List' causes great angst across the Academic Departments as program delivery is at stake and finding a solution is challenging if a departmentally-controlled room is not available.

"Most of our classes get rooms but for those that don't, it causes absolute pandemonium for our team – takes days to resolve. It is really difficult."

"The policy for unplaced courses is arduous for departments. Running reports and scouring the campus for possible spaces, begging other units for rooms under their control, is time-consuming and difficult."

"Perhaps the most frustrating issue that scheduling coordinators need to deal with is the number of unplaced sections every semester, especially for the fall-semester schedule published the previous spring: with the large number of unplaced sections, it's a round-the-clock mad rush at the last minute to get sections placed in a classroom (and often not even an appropriate classroom) before the scheduling goes live."

- **Requesting centrally controlled classrooms for unplaced courses:** Strong complaints about the process and time required for Departments to request available centrally-controlled rooms after Blackout to resolve unplaced courses. Current process: Departments must wait and monitor for cancellations on a system that operates on a 24-hour time lag; send room request ticket to RO; wait to find out if request granted; repeat if unsuccessful.

"It is the most ARCHAIC and inefficient system devised by man."

"We can only ask for one room at a time yet we may have 10 unplaced courses. By the time we get a no, the other options may have disappeared."

"Very time intensive and worrisome process for our staff. All done via RT ticket system with limited feeling of collaboration so it is hard to voice specific, individual needs."

- **Requesting departmentally controlled classrooms for unplaced courses:** There is no mechanism to share information on the availability of departmentally-controlled rooms to resolve unplaced courses. Departmental staff must contact colleagues in other departments in person, by phone or email in a time-consuming, hit-or-miss fashion. Efforts are further challenged by the fact that information is provided on the functional group that controls a local room but not whom to contact.
- Academics carefully develop program schedules to achieve a pattern of delivery that optimizes learning for students, minimizes course conflicts, balances teaching workloads, provides research time for full-time faculty, considers outside commitments of adjunct faculty, etc. Yet when courses are not assigned rooms after Blackout at the times

requested, delivery plans become compromised in the scramble to solve the room assignment crisis.

"All my optimizing goes out the window."

"It often means that in the end, my carefully crafted schedule is severely compromised."

- RO has no mechanism to prioritize manual room assignments other than to address the needs of Departments with the highest number of unplaced courses.

"We may ask for 5 classes to be scheduled on Tuesday at 10AM and will find that only 2 are placed after Blackout. But those two that are placed may not be our priority choices. Unplaced could be a course that students need to graduate, or a time that is the only slot when a faculty member is available to teach."

- Many Department Chairs and Directors spend significant time working on unplaced rooms which is not the best use of their valuable time.
- Some Departments resort to tactics such as holding 'phantom sections' until plans become firm (although this is getting harder since Departments must have the funds for delivery to do this).

"It is a vicious cycle – the more angst, the more tempted we are to use such tactics."

- Departments may not offer available locally-controlled rooms to other departments since they feel they need to hold them in reserve as a 'Plan B' for their own delivery needs.
- A small Department with no departmentally-controlled space reports having lost their scheduling support person and now lacks *"the expertise and wisdom to play the game"* to get the rooms they need.
- Inventory is dictating delivery: Departments report being forced to reduce class section sizes due to lack of room availability at the needed capacities. Some students lose the opportunity to take certain courses and faculty workloads become unbalanced.
- Stress for Departments is compounded by the short time period available to find room assignments for unplaced courses between the end of Blackout and the start of registration.
- Departments report that if they are unsuccessful in finding a room placement, their course will be dropped, even if it is critical for program delivery.
- Several Departments voiced the opinion that it should be the responsibility of the RO to find room assignments for unplaced courses.
- There is no mechanism during course loading for Departments to indicate that more than one timeslot would be acceptable for delivery of a course. Tapping such flexibility could help to alleviate scheduling challenges at times of peak demand.

"It is most unfortunate when one hires special adjunct faculty to teach a course at a time conducive to their schedule and the needs of the program, only to learn from Scheduling that no room for that size class is available at that time, without any suggestion of perhaps the time block before or after as alternatives."

Scheduling Process**Scheduling Timelines**

The scheduling process for each term is carefully mapped out in time by the RO to ensure that the schedule is ready by the date registration opens. The table shows the dates set by the University for registration for each term of the 2017/2018 academic year.

Summer 2017	Schedule Live	January 30
	Registration starts	March 6
Fall 2017	Registration Clearance Available to Undergraduate Advisors	March 6
	Schedule Live	March 27
	Registration starts	April 24
Winter 2018	Schedule Live	September 18
	Registration starts	October 23
Spring 2018	Registration Clearance Available to Undergraduate Advisors	October 09
	Schedule Live	October 23
	Registration starts	October 30

The timing and duration of each phase of the scheduling process determines, in turn, the information available to build the schedule, scheduling staff workloads, and the capacity of the University to develop quality, conflict-free schedules.

Issues and Comments**Registration Target Dates**

- UMBC understands that its student registration dates are in line with those at peer institutions, an important consideration to ensure UMBC remains competitive.

Notwithstanding, it is worthwhile to examine the implications of established scheduling timelines in light of their impact on the ability of the Academic Departments and the RO to build quality schedules. In general, the earlier schedules are built, the more challenging it is for schedulers to access accurate planning inputs such as enrollments, adjunct availability, etc. and the more likely corrections will need to be made later in the scheduling process. Changes to schedules after they have been published, particularly changes to the time of course delivery, tend to be detrimental to students who may have planned work and family commitments around schedules they thought were reliable. On the other hand, open registration that is close to semester start may result in schedules that require fewer changes but leave students with less time to plan commitments around their academic life.

"It is good for our students for schedules to be ready early in the year since students have jobs and commute. What is hard is finding adjuncts so many months in advance."

"Registration is too soon because students do not yet know if they are failing any of their courses."

"From an advisor's perspective, it is nice to have the schedule available early so I don't have to cram advising 100 students into an impossibly short time."

Duration of Post-Blackout Period to Resolve Unplaced Classes

- Academic Departments find the short time period available to resolve unplaced courses to be very challenging. In 2017, 1-week was available post-Blackout for Academic Departments to find room assignments for unplaced courses. The RO extended this to 2-weeks for Fall 2018 in recognition of the difficulties faced by Departments in completing this task.

Timing of Post-Blackout Period to Resolve Unplaced Classes

- For Fall semester scheduling, the end of Blackout and Post-Blackout coincide with Spring Break, a timing set by the RO to allow for undisturbed work on scheduling. However, some Departments find this timing difficult since their scheduling staff often go on vacation for Spring Break.

General Timeline Comments

- Many academic stakeholders find the overall scheduling timelines challenging given the high degree of manual work and coordination required for success.

"The challenge with the time line for scheduling is that it gets earlier and earlier so you are never not scheduling. You don't even have time to deal with the issues related to the semester you are in before you are asked to deal with the next one. Then you put catalog review on top of it, and you are juggling way too many time-consuming activities. Plus, very few, if any, departments have a scheduler. Everyone is doing this on top of another job, and the complexity has only grown."

"The timeline is ridiculous. One must plan the next semester's schedule as soon as the current semester begins. This can become very confusing when one must sort out issues with the current semester's schedule and the next semester's schedule at the same time. The timeline requires departments to secure those resources up to nine months in advance for fall schedules and three months for spring schedules, which makes it very difficult to secure commitments from potential adjunct faculty."

"Meetings hosted by the Registrar's Office occur too late in the scheduling process. The Kick Off Meetings take place several weeks after the schedule has been opened. The Lecture Hall Meeting takes place a week before the schedule is due (this is good to offer departments/programs time to compile their schedules, but has a negative impact if they cannot acquire LH space and thus need to rework their schedule with only a week remaining). Since lecture halls are essentially locked in to specific departments/programs (provided the rollover), there shouldn't be any reason why the meeting couldn't take place earlier (and if the department/program doesn't acquire sufficient space at the meeting, at least they will have more time, post-meeting to determine plans, i.e. separate, smaller sections, a different time, etc.)"

- Very tight for specialty programs like EHS given dependence on other departments completing their schedules.

Spring, Winter, Summer Timelines

- Challenging to meet Spring scheduling deadlines during September since it is inappropriate or difficult to consult faculty in the Summer and September is a busy month for academic staff and faculty.
- Challenging that Winter schedules are due within two weeks of Spring schedules.

Scheduling Process**Scheduling Constraints**

Scheduling constraints are factors that drive scheduling decisions. An institution may have policies setting out allowable constraints or may leave decision-making to the discretion of academic departments. An important constraint faced by all post-secondary institutions is the availability of faculty for course delivery.

Issues and Comments

- Academics state that most UMBC Departments have a reasonable idea of the programs and courses they will deliver. The most challenging aspect of developing a course delivery schedule is establishing 'the who and the when'. These elements are often interlinked in that *who* will teach can drive *when* a course will be delivered if the instructor has constraints on his/her availability. This is particularly true for adjuncts and can be seen in the high proportion of adjuncts who teach in the 4:30 – 7PM 1x/week timeslot.

Whether to hire adjuncts to 'fit the schedule' or to hire adjuncts who can teach during pre-set times can be a policy decision of an institution and/or a variable choice based on the circumstances around particular courses and adjuncts. Many institutions have policies to 'hire to the schedule' but must make exceptions in cases where specialized skills are required and very few instructors are available with the required knowledge.

UMBC academic staff report a tendency to hire to the availability of adjuncts for smaller sections (mostly specialized courses) and to find adjuncts who can accommodate the time of delivery for large section courses (mostly introductory courses). It is an issue that merits review especially if accommodation of faculty needs are negatively impacting the quality of schedules for students.

"I try to accommodate faculty requests. I don't want to hear 5 years from now a faculty saying they could not achieve tenure because they did not have sufficient time to conduct their research."

- After scheduling is complete, an Academic Department may learn that a faculty member can no longer teach at an established time in which case it is very difficult to get a different room assignment to accommodate a replacement adjunct.

Scheduling Process

Coordination Across Departments

Coordination across departments, colleges, schools and/or the RO is required for inter-dependent scheduling elements such as combined sections, service and general education courses to minimize conflicts and ensure students can access the courses they need to graduate on time.

There is no mechanism other than personal communication to achieve needed cross-departmental coordination of courses and conflict reduction.

Some colleges such as COEIT and CNMS meet to coordinate the time of delivery for service courses, examinations, etc. Other groups coordinate one-to-one or department-to-department.

Some unique programs such as EHS do not built their schedules until 4+ other departments have completed their scheduling.

Issues and Comments

- Stakeholders report that coordination can be hard to achieve and time consuming and ease of work can depend on the relationship between the parties. A critical missing link is lack of access to peer department scheduling plans.

"Because so much of the scheduling task is decentralized and we are unable to see other units' schedules as they are being developed, units build schedules blindly, count on past history, or must invest considerable time to query every unit with whom they would want to coordinate."

"The inability to see each department's preliminary schedules sometimes makes it difficult to plan for your own department courses and often requires an on-the-fly adaptation which may not be the most effective use of staff or time."

"How well coordination works can depend on the individuals involved."

- Coordination is complicated by the fact that certain Departments 'own' certain courses that may be delivered by other Departments. The Department with ownership must give permission for a course to be offered and has veto rights over the faculty selected to teach.
- For combined classes, both Departments must enter the course loading information into the scheduling software exactly the same way for the combining to work correctly.

"My scheduling staff person spends an overwhelming amount of time during scheduling season to call her counterpart trying to get the details of the combined classes correct. It is way too cumbersome."

"The level of proof reading and double checking through the semester is crazy."

"Optimally there would be a better way to handle cross-listed and combined courses. The current process of using spreadsheets and RT tickets is cumbersome and unwieldy."

- Since a main focus is on eliminating conflicts within majors, it is especially challenging to coordinate the reduction of dual major and major/minor course conflicts.
- A major challenge is when changes occur post-coordination since the inter-dependency of course delivery times often cause a cascade of changes that can make schedules unworkable and are difficult to resolve.

"When changes happen, it is an emergency. I must drop everything to fix the problems because they are so critical. This is despite the fact I am working on scheduling other semesters at the same time and have other job responsibilities as well."

"If an anatomy /physiology class shifts by half an hour, it causes a domino effect on our courses [EHS] even to the point that our students may have to stay on campus a whole extra year."

Scheduling Process**Departmentally Controlled Classrooms**

Locally-controlled instructional space includes classrooms/ seminar rooms and teaching labs.

The *Utilization Analysis Report*, May 9, 2018 shows that the 44 departmental classrooms have an average utilization rate of just over 30% during Fall and Spring semesters based on centrally recorded course activity. Not captured in the analysis are the many department-scheduled activities in these rooms such as graduate classes, dissertation defenses, zero-credit topic courses, colloquia, job talks, large research team meetings, staff meetings, faculty meetings, graduate program meetings, undergraduate program meetings, other committee meetings, and other teaching and administrative functions that are vital to academic life and student success. Staff report that State guidelines require scheduling of more than 20 hours per week for a room to be considered teaching space.

Issues and Comments

- There is no mechanism in place to assess and ensure that each College / School has the inventory of locally-controlled instructional space required to support its needs.
- According to stakeholders interviewed, some Colleges and Schools have local control of most of the rooms they need to deliver their programs while others are more dependent on the central pool of instructional space. Newer academic units are less likely to have dedicated space.
- Some Departments report having converted meeting space into seminar rooms to support their scheduling needs and consequently are now short of meeting space.
- It is unusual in the experience of the Consultant Team for large capacity classrooms (e.g. 41 – 93 seats) to be locally controlled. It is noted that some of these rooms at UMBC are specialized college learning spaces such as CNMS' Active Science Teaching and Learning Environment (CASTLE) in UC-115D with 93 seats.
- Very strong concern voiced by some Departments around maintaining local control of departmental teaching spaces.
- As mentioned elsewhere, the lack of a tool to share information on when locally-controlled classrooms are unused by their home departments limits opportunities for sharing these spaces and exacerbates the post-Blackout challenges faced by departments seeking room assignments for unplaced rooms.

Distribution of Locally-Controlled Classrooms*

College or Unit	ECS Room Capacity Range	Total
CAHSS	1-8 Seats	8
	9-16 Seats	2
	17-24 Seats	1
	25-32 Seats	8
	33-40 Seats	1
	41-48 Seats	1
	49-60 Seats	1
CAHSS Total		22
CNMS	17-24 Seats	1
	25-32 Seats	1
	33-40 Seats	1
	61-80 Seats	3
	81-100 Seats	1
CNMS Total		7
COEIT	17-24 Seats	1
	25-32 Seats	2
	33-40 Seats	1
	41-48 Seats	1
	49-60 Seats	1
COEIT Total		6
Other	9-16 Seats	1
	17-24 Seats	6
	25-32 Seats	1
	33-40 Seats	1
Other Total		9
Total		44

* List to be confirmed by Facilities Management

Scheduling Process**Departmentally Controlled Teaching Labs**

The Consultant Team recommends 60% as a target weekly utilization rate for teaching laboratories based on instruction time as well as set-up, take-down, open lab time, project work, practice, production, etc.

The *Utilization Analysis Report*, January 9, 2019 shows that the following teaching labs are currently exceeding the recommended weekly utilization rate of 60%:

- Writing Labs in the Performing Arts & Humanities Building with peak rates of 69% utilization in both Fall 2017 and Winter 2018
- PHYS-111 at 70% and 67% in Fall 2017 / Winter 2018
- Dance Studio PAHB-337 at 64% in Fall 2017
- Foundation Studio in Fine Arts-114 at 67% in Fall 2017

Issues and Comments

- No common campus-wide scheduling issues related to teaching laboratories were highlighted by stakeholders during the consultations.
- Physics offers evening labs due to room constraints and is concerned about safety with students on campus until 10 PM and lack of availability of student services.
- Several Chairs are concerned about accommodating growth as lab sections are reaching capacity.

Scheduling Process**Examinations**

Tests, mid-terms, and final examinations are an integral part of most courses and Departments use a variety of tactics for delivery.

Issues and Comments

- Delivering exams and tests in Lecture Halls is a major concern due to the lack of capacity to appropriately separate students. Some Departments schedule multiple lecture halls during a single evening to run exams for 1,000+ students at one time. Other Departments use multiple versions of the same exam so students cannot cheat even when sitting close together.
- Some room bookings are made solely to accommodate examinations even though testing is an intermittent activity leaving those rooms unavailable for other teaching activities.
- One Department asked during the consultations for the University to consider establishing a Testing Center. Such facilities can support proctored examinations for certain courses such as online deliveries, students who miss tests and exams, etc. It was noted that the Community College of Baltimore County (CCBC) provides proctoring services.
- Another suggestion was made to hold examinations on Saturdays to relieve the challenges posed by scheduling exams during weekdays.

Scheduling Process**Academic Advising**

Given UMBC's course-based program delivery model and customized schedule for every student, Academic Advising is an essential service at UMBC providing students with the information needed to make wise course selection decisions leading to timely degree completion.

Issues and Comments

- Concern was expressed about the short span of time available for Advisors, particularly in large Departments, to advise students prior to registration.
- Concern was expressed around the fact that Advising is often carried out 'blind' since Advising starts before the schedule is finalized. With no central repository to identify which courses will be offered in a given semester prior to the schedule going live, Advisors tend to have firm knowledge only of the courses that their department is requesting and use their retained knowledge of past semesters to surmise the courses offered by other departments. Post-Blackout unplaced courses are particularly problematic, and students may miss out on these courses since they are not published until room assignments are found.
- 'Finish 15' is UMBC's commitment to ensuring students graduate on time by providing support and encouragement to students to take the 15 credits per semester / 120 credits in total needed to complete a degree within 4 years. A review has recently revealed that some Advisors are developing 12 credit schedules for freshmen rather than the necessary 15 credits. Providing Advisors with access to comprehensive and accurate information on course availability and fostering scheduling processes that minimize course conflicts support *Finish 15* objectives.

Scheduling Policies**Scheduling Guidelines and Committees**

Currently, UMBC's scheduling policies are limited to a description of standard time delivery patterns and scheduling timelines.

The 'Classroom Scheduling Principles' document was developed in 2004 by the Classroom Committee and approved by the Faculty Senate. The document outlines the plan for standard time blocks currently in use and points to the need for planning for instructional room technology and maintenance.

Issues and Comments

- The University recognizes that exceptions have eroded existing guidelines over time and conditions have evolved over the past 14 years such that a revisiting of scheduling guidelines would be prudent. A first step in this process was to commission the *Instructional Space & Scheduling Review Study*.
- The Consultant Team commends UMBC for having in place the Course Demand Committee and Classroom Committee to provide multi-stakeholder forums for addressing program planning and classroom inventory concerns. Stakeholders expressed a desire for transparency around the work of the Committees and the opportunity to contribute input to inform decision-making.
- The stakeholder community expressed interest in the formalization of more comprehensive scheduling policies including matters such as whether courses required for majors should be given scheduling priority over 'pure' electives; whether seats should be reserved for majors; whether large sections should be given preferential access to peak demand timeslots; etc.

Scheduling Policies

Standard Times

UMBC Block Pattern

UMBC course delivery follows the following standard time block meeting patterns that have been in effect since 2005:

Day of Week	Period Duration	Meeting Frequency	Time of Day
Monday / Wednesday / Friday	50-minutes	3x / week	All day
Tuesday / Thursday	75-minutes/	2x / week	All day
Monday / Tuesday / Wednesday / Thursday	150-minutes	1x / week	4:30PM – 7PM 7:10 – 9:40PM

Exceptions to these set blocks are incorporated into the schedule according to the needs of individual programs, courses and events. This includes the delivery of 75-minute standard blocks on Monday and Wednesday afternoons.

Issues and Comments

Consultations revealed vigorous debate about the most pedagogically effective delivery pattern. The table records views put forward by stakeholders:

Meeting Pattern	Opinions Expressed
50-minutes MWF	<p>Low support voiced for 3x week / 50-minute pattern due to:</p> <ul style="list-style-type: none"> Insufficient time for most courses beyond introductory level given current pedagogical practices Delivery of content challenged by poor attendance on Fridays
75 minutes TR	<p>Strong support voiced for 2x week / 75-minute pattern due to:</p> <ul style="list-style-type: none"> Suitable duration for content delivery and learning retention by students Supports active learning activities by providing time for discussion and group work as well as instruction Provides students with more time per week for outside paid work as compared to 3x/week delivery pattern Provides full-time faculty with more uninterrupted time per week to focus on research as compared to 3x/week delivery pattern Better supports efforts by many Departments to limit the number of times per week adjuncts come to campus in consideration of work commitments, parking and gas costs
150 minutes MTWR	<p>Strong support voiced for 150-minute 1x week delivery option:</p> <ul style="list-style-type: none"> Late afternoon/evening timeslot and single delivery/week is preferred by adjunct faculty and students who have daytime commitments such as work Suitable duration for content delivery and learning retention by students for certain courses and delivery types (e.g. seminar type) Ditto last three bullets above under 75-minute pattern <p>Reservations expressed about this delivery pattern:</p> <ul style="list-style-type: none"> Concern about pacing of course delivery and whether students can stay attentive for 2.5 consecutive hours Concern that classes wind up shorter than the scheduled duration Concern around lack of student services available in the evenings Concern around safety of students and faculty in the evenings Some feel 7:10 – 9:40PM option is too late
General	<ul style="list-style-type: none"> Merit of each meeting pattern varies according to course level and content Meeting pattern preference varies by instructor

M – Monday
T – Tuesday
W – Wednesday
R – Thursday
F – Friday

- Pattern choices are often dictated by non-pedagogical factors.

E.g. combined Level 400 and graduate courses are generally offered from 4:30 to 7PM since many graduate students work; Departments with graduate students working as TAs in undergraduate labs schedule graduate courses in the mornings so graduate students are available to teach in the afternoon labs; programs catering to students who are working adults are held in the late afternoons/evenings; ELL programs adhere to stringent student-teacher contact hour requirements to maintain immigration status of students that limits schedule flexibility, prevents adherence to standard times and makes finding rooms very challenging

- Standard patterns of delivery can be a “struggle” for Departments to achieve or are not achieved.

E.g. Preferred delivery pattern is lecture for full cohort accompanied by discussion and seminar sessions delivered to smaller groups. Department finds it often cannot schedule all groups in the correct sequence due to restrictions of standards times making it hard to plan lessons since some groups receive reinforcement through discussions and seminars and some do not. In the past, have made the pattern work only by scheduling into inappropriate rooms – e.g. small group sessions offered in lecture halls or computer labs

E.g. Department describes developing non-standard delivery pattern since rooms could not be found to accommodate a standard meeting pattern.

- Exceptions to the standard delivery pattern:
 - Most graduate classes are held on Monday-Wednesday evenings in 75-minute blocks.
 - Programs such as 4-credit programs, language programs, EHS, those using hybrid delivery. (Some have locally-controlled rooms but must access centrally-controlled rooms if local capacity is exceeded).
 - Departments may schedule locally-controlled rooms using non-standard patterns.
 - After Blackout, Departments may request non-standard times for centrally-controlled rooms.

The lack of congruity between start and end times for standard and non-standard delivery patterns increases the difficulty and stress of scheduling and increases course conflicts for students.

Large number of exceptions are believed by some stakeholders to be compromising access to standard times.

- 3x/week pattern is challenged by the low popularity of Fridays, particularly Friday afternoons

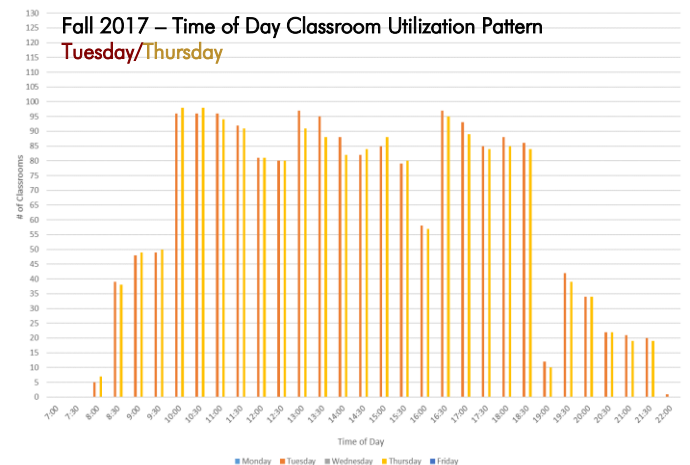
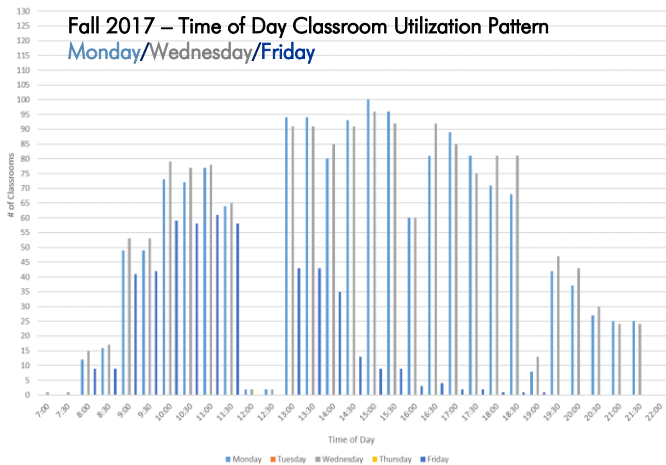
“I have experimented with W/F classes and only the most popular instructors can fill the 1 pm slot, but no one can fill later slots.”

“Out of 30 full-time faculty, we have 2 who are amenable to teaching MWF. They complain that attendance for Friday classes is less than 50%.”

- Maximizing student course choice including for General Education courses is important to the mission of the University. In some cases, schedule conflicts mean that students are able to take the courses they need but not the courses they want.
- Stakeholders suggest that the rigidity of the block pattern may intensify demand for certain scheduling timeslots – e.g. Tuesdays and Thursdays at 11AM. There is strong support for expansion of 75 minute and 150 minutes block patterns to, for example, MW, WF, MF. Such options may also help to better leverage Fridays.
- Many stakeholders expressed a desire for more flexible options and openness to considering changes to the established block delivery pattern to better match current best practice in pedagogy and student needs.
- Suggestion that early morning periods may be better attended if start-time is 8:30AM rather than 8AM

Issues and Comments – Actual Utilization Patterns

The following graphics from *Utilization Analysis Report*, January 9, 2019 data show time-of-day utilization for the Fall 2017 semester for all 127 classrooms on campus. The graphic on the left shows Monday/Wednesday/Friday activity; the graphic on the right shows Tuesday/Thursday activity.



- The preference for 75-minute periods expressed during consultations is reflected in the higher utilization seen for Tuesday-Thursday morning timeslots.
- The popularity of the 150-minute time block expressed during consultations is reflected by the high utilization seen on Mondays to Thursdays from 4:30 – 7PM. Typically, at universities and colleges, utilization drops off during this time span. The flexibility afforded by the multiple standard meeting patterns that are operative during this timeframe may also contribute to the high utilization.
- Significantly lower use on Fridays for all timeslots is visible particularly after 1PM and implies the Monday/Wednesday/Friday block pattern is not consistently followed through the 3 days of the block.

Scheduling Policies

Free Hours

UMBC has a generous provision of three free hours per week: 12 to 1PM on Mondays, Wednesdays, Fridays during which time classes are not scheduled. This tradition was initiated in 1970 when a proposal by the Student Government Association was adopted for the establishment of free, unscheduled hours for student assembly, organization and advising. The timing was changed from 1 - 2PM to 12 – 1PM in 2005 to encourage attendance at 1 – 2PM classes on Fridays.

Free hours are rigorously enforced at UMBC as evidenced by the time of day graphic (see previous page) showing almost no activity scheduled during these timeslots. For centrally-controlled rooms, activity during these times must be approved by the Vice Provost, Academic Affairs.

A review of past *Weekly Retriever* articles found that occasional discussions through the years of modifying or eliminating free hours has always been countered by strong support for maintaining the tradition by students and faculty¹. A 2017 *Retriever* article advocates for 5 free hours per week²!

Issues and Comments

The following table records opinions gathered during the consultations on the topic of the free hour tradition.

Pro/Con	Stakeholder Opinions Expressed
Free hour positives	<ul style="list-style-type: none"> Valued by students as time for community building, student life activities, events, etc. and as an opportunity to have time to eat lunch Valued by staff as an opportunity for academic meetings and events Supports interdisciplinary interactions
Free hour negatives	<ul style="list-style-type: none"> Removes three hours from weekly scheduling window at times of high demand – 3 hours x 127 classrooms = 381 hours of potential instructional time per week High demand for food services at The Commons and University Center causing overcrowding and long line-ups. Expensive for Chairs since everyone attending meetings at lunch hour expects to be fed! Suggestion that a move of the free hour to 4PM would save a lot of money. One Department expressed preference for the former 1 to 2PM free hour timing since it allowed for 2 morning timeslots for departmental classes (9 to 11AM + 11- 1PM) versus current condition where only one 2-hour class can be scheduled before the free hour. Another Department suggests moving the free hour later in the day to 4–5PM which is a common time for colloquia and would push the evening courses back by just 1 hour.

The provision of three free hours per week is an unusually high allocation in the experience of the Consultants. The University must balance the benefits to the community of the three free hour policy with the fact that a significant number of hours are removed from the scheduling week during times of peak demand on the instructional space pool.

¹ <https://magazine.umbc.edu/free-hour/>

² <https://retriever.umbc.edu/need-five-free-hours-lunch/>

Scheduling Resources & Tools

Staffing for Scheduling

RO Staffing for Scheduling

Scheduling is undertaken by the Catalog & Scheduling group within the office of the University Registrar. Central staffing for scheduling is limited to 1.5 positions - the Associate Registrar whose portfolio includes other responsibilities and a full-time Scheduling Specialist.

The University recently changed the position title of the senior manager responsible for scheduling from Assistant Registrar to Associate Registrar in recognition of the importance of this role.

Departmental Staffing for Scheduling

- 40+ Academic Chairs and Directors develop schedules for the programs they deliver.
- 40+ Scheduling Coordinators in departments are responsible for uploading scheduling data and liaising with the central scheduling staff.

Issues and Comments

- There is low capacity in the RO to deal with high demand time periods (e.g. responding to RTs), providing support to Academic Departments during schedule development, etc.

"I was always frustrated by the slow response to tickets by the RO but then I found out that there was only one person doing this job so I was no longer surprised."

"People at the Registrar's office working on the schedule are very helpful, but they seem to be alone. More people that do other roles should be trained to offer help during the busiest times in the schedule."

- Over the past 10 years, there has been a high turnover rate of RO scheduling staff, notable in contrast to other RO positions. Reasons put forward include the stress of the scheduling role – workload and difficulties associated with coordinating with academic scheduling representatives and achieving successful scheduling outcomes.
- The very low RO staff complement is risky if assigned staff become unavailable to work
- The very low RO staff complement responsible for scheduling is unusual in the experience of the Consultant Team and reflects the highly decentralized scheduling model in place at UMBC.

Scheduling Resources & Tools

Scheduling Software Tools

UMBC uses 25Live® Web-based Event Scheduling software by CollegeNET® that allows users to view events, locations and resources, schedule events and assign locations and resources to them, and check location and resource availability.

Course information is entered into Peoplesoft® and then uploaded to 25Live towards end of the Blackout period. At that time, the 25Live optimizer is run to generate room assignments. The output is then loaded back into Peoplesoft. As previously described, much manual work is required to finalize course scheduling including finding room assignments for courses left unplaced by the software.

The RO has considered customizing its existing software core processes to improve usability but has not proceeded due to the degree of complication, costs and risks.

Issues and Comments

- AT UMBC, the use of 'event' planning software rather than 'scheduling' software, in combination with the constraints placed by current scheduling practices results in a scheduling process that requires a significant amount of manual, time consuming work by both central and departmental staff to generate workable schedules each semester.

There are scheduling software enterprise systems for post-secondary institutions on the market that automate and optimize scheduling to a greater degree than the processes currently in use at UMBC.

Robust scheduling software provides user-friendly interfaces for course loading and has the capacity to generate conflict-free schedules based on course delivery details, constraints and room attribute information provided by users. Algorithms optimize schedule quality for students, faculty needs and workloads, and room and seat utilization. Course loading allows constraints such as prerequisites / co-requisites, delivery patterns (e.g. lecture before lab), maximum gaps between classes for students, as well as room attribute requests such as type of learning space (e.g. active learning, case study, computer lab, etc.) to be specified. The capacity to describe a broad range of constraints and attributes without prescriptive 'forcing' of course schedules allows scheduling software algorithms to work to build global schedules that optimally balance the needs and priorities of all course delivery across campus.

The Consultant Team suggests that it would be worthwhile for UMBC to investigate the merits of upgrading software use to support a more efficient scheduling process for users and better-quality outcomes. It is understood that the University already licenses the scheduling enterprise software, Schedule 25. As recommended in the section on Planning Directions and Appendix E, the University may wish to evaluate the capacity of Schedule 25 to support desired changes to scheduling business practices.

Scheduling Resources & Tools

Predicting Demand and Enrollment Growth

With plans for sustained growth over the next decade, UMBC will continue to need to plan for expanded and new course sections and to ensure course availability to support timely degree completion by students. As described in Section 2, two groups chaired by the Vice Provost, Enrollment Management & Planning bring together a range of stakeholders to support enrollment planning and decision-making.

- **Course Demand Committee (CDC)**
Regularly monitors and assesses undergraduate course utilization, demand and availability to address short-term surges (up or down) in enrollment. (Long-term secular changes are addressed separately via planning for faculty hires, curricular changes, etc.). Works closely with departmental chair and dean to increase existing course section capacity or open additional course sections. Funding provided to support the addition of approved seats/sections – if demand sustained for two consecutive years, funding becomes permanent.
- **Enrollment Management Work Group**
Monitors enrollment data, assesses/analyzes enrollment trends, and develops and implements strategies to meet institutional enrollment goals.

Issues and Comments

- UMBC does not currently have in place mechanisms or analytics to predict demand and identify pressure points that would support the scheduling process. The lack of predictive tools limits the University's ability to avoid capacity crisis situations in real time and also to understand and test the impact of potential changes to enrollment and delivery.

Simple example: If the University gathered from all departments projected program information on section sizes, number of sections and room types for all classroom instruction planning for the following year, a very simple calculation will provide an estimate of classroom space requirements. E.g. 800 hours of demand for 32-seat classrooms will require an inventory of 22 classrooms of capacity 32 seats assuming an 80% utilization target and a 45-hour weekly scheduling window. Based on this type of estimate, the University can identify 'red flag' issues such as shortages of certain room types and capacities and can develop solutions in advance of semester start (e.g. renovating rooms to match required capacities, plan to deliver outside of the standard weekly scheduling window, adjust sectioning plans for those classes, etc.). Although this type of predictive analysis is only a high-level indicator of need, many institutions find it useful as an annual 'check' to ensure that inventory matches the needs for course delivery.

"There are no tools to test or understand consequences if changes are made. Therefore, we tend not to make changes since 'bad things' happen' when we do."

- Challenges for departments experiencing growth include finding space to accommodate additional students through increased section sizes and/or new sections, and also finding and funding additional faculty and workloads.
- Colleges note that addressing incremental growth by hiring adjunct faculty from year-to-year does not support the long-term goal of hiring additional full-time faculty who will conduct research and support graduate students.

- Challenges accrue on many fronts when matching enrollment to space. Examples provided by stakeholders include:
 - Students can sign up for 19.5 credits in order to 'shop' around for the courses they want so Semester Day 1 enrollments may be much higher than the final course enrollment.
 - A Department may gain enrollment pressure funds but then cannot gain a room; however, if the room is obtained first, the Department is told that they opened the room so are not eligible for enrollment pressure funding. Departments therefore tend to wait and obtain funding first.

Scheduling Outcomes

Disconnect between Scheduling Challenges Experienced by Departments and Low Overall Room Utilization

Consultations during this study reveal that many stakeholders involved in scheduling at UMBC experience high levels of stress and dissatisfaction with the current scheduling process. Frustration centers on process inefficiencies, the large number of unplaced courses following Blackout and competition for access to Lecture Halls. The challenges in obtaining room assignments lead academic stakeholders to conclude that the classroom inventory is in shortfall.

This experience of users strongly contrasts with the findings of the *Utilization Analysis Report*, May 9, 2018 which shows that UMBC's classroom inventory has significant latent capacity: peak daytime utilization is only 47% of a weekly 45-hour scheduling window for all classrooms and 55% for centrally-controlled classrooms (Fall 2017); even at peak daytime utilization, 26 of 128 classrooms are unused (Spring 2018). Centrally controlled Lecture Halls are the only room type that does show high demand pressures with utilization rates ranging from 66% – 78% in Fall 2017 and Spring 2018 with all rooms booked during some late-morning timeslots in Fall 2017.

Issues and Comments

- One major reason for this conundrum is that Departments are requesting rooms at the same limited number of popular delivery times due to a number of factors:
 - delivery pattern restrictions related to adherence to standard times.
 - delivery pattern restrictions related to pedagogical requirements such as lecture before lab, availability of adjunct faculty, availability of graduate students to take courses due to research/work commitments, etc.
 - unpopularity of early mornings and Fridays among students and faculty.
 - free hours which, for exemplary reasons, remove 3 prime hours from the UMBC weekly scheduling window.

Another reason is that the scheduling process has inefficiencies that limit the matching of course events to available space. Factors include:

- Inability to tap departmental flexibility in course delivery timing due to software restrictions that limit departments to entering a single timeslot for each course event delivery – e.g. 11AM when 9AM or 10AM may also be acceptable.
 - Mismatches in data records in PeopleSoft and 25Live® that result in the optimizer omitting available classrooms when room assignments are made.
 - Operational isolation with Departments working independently on schedules for the delivery of their programs with no global tool to access information on potential conflicts with other Department schedules or the status of instructional room availability.
- A focus of work to enhance scheduling at UMBC should include developing strategies to more evenly distribute demand for instructional space across the scheduling week.

Scheduling Outcomes

Mismatches Between Learning Delivery and Room Type

UMBC's scheduling tools and processes do not utilize available activity and room attribute information that would allow for improved matching of pedagogy and room type:

- Most courses are listed as 'lecture', even non-lecture deliveries such as Dance classes
- 'Computer lab' and 'accessibility' are the only room types that can be requested during course loading and that are considered by 25Live® during optimization

For other room attribute requests, Departments must separately submit tickets that are then addressed manually by the RO.

Issues and Comments

- After Blackout when manually assigning rooms to the unplaced course list, due to the demands of the scheduling process, the RO prioritizes assigning rooms with room capacity as a priority consideration and other room attributes such as typology only matched if possible.
- Departments report that faculty are frequently booked into rooms that do not fit their pedagogical needs - e.g. an active learning room is assigned when traditional lecture delivery is preferred or vice versa; a lecture is scheduled into a computer lab, etc. For many Visual Arts classes centered around the display, analysis and discussion of images, being unable to request and obtain rooms with appropriate screens, dimmable lights, etc. impacts on the quality of the in-class learning experience.
- Faculty that are assigned classrooms they are unhappy with often complain to their Department and ask for a better room. After semester start, Departments can request different rooms but often, faculty must remain in the room originally assigned.

"At the start of every semester our faculty invest considerable time, emotion and effort to complain about their assigned rooms to convince the Registrar's office to relocate their classes."

- To work around this issue, Departments will sometimes request a specific room, one they are familiar with that has the room attributes they desire. In the 'big picture' of scheduling for the campus, this limits the RO's flexibility to match requests to space in cases where there are several rooms on campus with the same capacity and attribute profile.
- One Department reports converting departmentally-controlled space to serve teaching needs unmet by the central pool. Accompanying issues included poor sightlines and A/V maintenance costs that must be borne by the Department.
- A Department with multiple courses requiring computer labs describes frustration around getting room assignments despite the fact the RO assigns these types of spaces early in the process. Other stakeholders describe issues with computer labs have lessened due to an increase in students bringing their own laptops to class.

"Computer lab space reservations should occur before the Blackout period so these room assignments are known with certainty because there is limited scope to move these in the period after blackout!!! (Yes, 3 exclamation points are needed.)"

- Department requests identification of classrooms that are white-board only as one of their faculty members is allergic to chalk dust and routinely requests a white-board-only room.

Scheduling Outcomes

Mismatches Between Course Section Size and Room Capacity

The *Utilization Analysis Report* found that ~65% of course hours in Fall and Spring semesters were scheduled in classrooms for which room capacity exceeded the number of students. This is not an unusual finding among peer institutions due to the fact that courses are planned on an aspirational basis, larger rooms may be requested to account for examinations, etc.

Issues and Comments

- There are instances seen in the Utilization Analysis and also reported anecdotally during the consultations, where the mismatch between section size and room size is extreme such as groups of 8 students booked into large lecture theatres. These occurrences stem from the many constraints placed on the scheduling process that lead schedulers to select a mismatched room since it is the only option available at the desired time.
- The proportion of mismatches where section size exceeds room capacity is appropriately very small (4%) since it should not happen at all. However, several Departments described instances where the number of students exceeded the available seats in assigned rooms.
- Departments tend to request room capacities that they know are available on campus. There is no mechanism for the University to collect information on actual department preferences for instructional space to inform capital decision-making.

Scheduling Outcomes

Scheduling Across Campus Precincts

During the consultations, faculty and students expressed slight concern about the location of assigned instructional space.

Issues and Comments

- Mild frustration expressed around LH assignments that are distant from the home building of a Department when the LH assignment process provides no opportunity to gain access to LHs in the Department's home building.
- Another Department described a situation where their faculty must travel *'to the other side of campus'* to teach when faculty from other Departments teach in comparable rooms in their home building. In some cases, part way into the semester, they swap rooms.
- Another Department notes *'it would be nice'* if faculty teaching back to back courses did not have those courses scheduled across campus.
- The RO confirms that current scheduling processes do not take into account room location on campus. In the past, the RO tested configuring 25Live® to define and schedule by campus precinct but abandoned the effort as the number of unplaced classes increased significantly.
- UMBC is a compact campus and the interval of 10 minutes between classes should be sufficient for class-to-class movement. However, many universities are able to successfully use scheduling software precinct prioritization features. UMBC's future efforts to develop measures to enhance scheduling processes and tools and reduce constraints may allow better matching of activity to location in the future.

Scheduling Outcomes

Pedagogical Consequences of Scheduling Process Challenges

When classes cannot be scheduled as planned by academics, negative consequences to learning delivery and students can accrue. The following list consolidates examples relayed during the consultations (some repeated from other parts of this section):

- Course section sizes reduced when Department cannot find rooms of required capacity leaving groups of students excluded from taking certain courses during a semester.
- Small section sizes maintained when larger ones desired in order to avoid having to deal with the uncertainty and stress of the Lecture Hall meeting.
- Sections booked into rooms with capacities inappropriate for section sizes when Department cannot find appropriate rooms - e.g. small sections booked into lecture theatre.
- When room large enough for delivery to full course section could not be found, Department split delivery into two sections with one taught by a professor and the second taught by a TA leaving half the students shortchanged.
- Department forced to make course hybrid when it could gain access to only one of two required weekly meeting times.
- Department with very small sections pre-emptively asks for a larger classroom than required in order to have a better chance of being assigned a room.
- Significant time and stress imposed on departmental staff responsible for resolving unplaced courses, taking them away from other tasks and duties.

Due to the complexity of the scheduling process, competing demands on limited inventory, etc., all universities experience situations where compromises must be made to ensure all courses are scheduled. However, at UMBC, inefficiencies with scheduling processes appear to be forcing academics to make a higher than necessary number of scheduling compromises that are deleterious to students and learning success.

Scheduling Outcomes**Schedule Quality**

A priority of a university's scheduling enterprise should be to generate quality schedules for students that optimize learning success and quality of the university life experience. Faculty schedules should likewise meet quality and contractual standards supporting effective teaching, time for academic commitments and research, and balanced workloads. Thirdly, the global schedule should achieve efficient utilization of the valuable campus instructional space resource.

UMBC does not currently have criteria or tools to measure the quality of schedules generated or recurring mechanisms to poll student and faculty satisfaction with schedules. Analyzing / gathering this information is helpful in informing efforts to enhance scheduling processes and outcomes.

During the consultations for this study, a student focus group was held, and academic staff answered questions and completed questionnaires on topics related to schedule quality. At the end of each meeting, participants were asked to write down, on the spot, an answer to the question: What is a Quality Schedule? See Appendix C for full record of responses from both students and staff.

Student Priorities for Quality Schedules

Based on the small sample of students consulted during the Study, the following elements of a quality schedule emerged as important to UMBC students:

- Ability to take needed courses without conflict to ensure timely graduation
- Flexibility to accommodate work commitments, student life activities
- Appropriate gaps between classes
- Classes timed to align with local transportation schedules to support travelling to campus and home safely and efficiently
- Cluster classes geographically to allow movement from class to class without being late
- Schedule courses into rooms that support the type of learning delivered – e.g. do not schedule discussion-based classes in lecture halls
- Schedule courses into classrooms with good sightlines

Campus Culture

Culture and Customs

All post-secondary institutions develop a campus culture and establish customs that tend to influence academic and administrative practices including scheduling.

Issues and Comments

- **Culture and customs in place** at UMBC that affect scheduling include:
 - Warm and collaborative community spirit on campus enabling, for example, sharing of locally-controlled teaching spaces among departments to resolve unplaced courses
 - Low scheduled course activity in early mornings and on Fridays particularly Friday afternoons.
 - Departmental ownership of space.
- Although certain customs are entrenched at UMBC, many stakeholders consulted expressed **openness to change** going forward:
 - Openness and active interest in increasing Friday activity on campus. Stakeholders feel this is more viable now that UMBC has transitioned from a commuter to more of a residential campus.
 - Openness to rethinking the degree of decentralization of responsibility for scheduling, particularly in light of the time, difficulty and stress involved with the current process.

Note on Online / Hybrid / Alternative Delivery Times

UMBC course delivery includes online, hybrid, weeknight and weekend deliveries that reduce demand for instructional space during daytime hours in comparison to traditional course delivery. For example, the plan to move some graduate programs online will reduce the demand for instructional space after 4PM.

Although an increase in these types of delivery modalities and course offering times will ease pressure on scheduling instructional space, any decisions to do so should be driven by pedagogical and student experience concerns.

Concluding Remarks

UMBC course activity is successfully scheduled and delivered each semester. However, as this section makes clear, there are shortcomings with current scheduling practices, tools and outcomes. Many staff find the scheduling process difficult, labor-intensive, time consuming and frustrating. Some Departments are forced to compromise best practice pedagogy and student access to courses to obtain room assignments.

It is through the commitment of RO and academic staff that success is achieved.

"The process works, but not because of its efficiency, but rather a large (too large) amount of personnel time is devoted to making it work because it has to work."

"Because this campus is so collaborative, this is why we can make things work. Everyone does try to help each other. Departments will share their rooms, and people are responsive when there is a need."

These challenges contrast with the utilization analysis finding that UMBC is not short of instructional space and actually has latent capacity in its instructional room pool.

As outlined in Section 5: Planning Directions, these findings support the imperative for the University to investigate strategies for addressing the identified issues in order to improve scheduling efficiency, reduce scheduling staff workloads, enhance the quality of schedules for students and staff, and improve utilization of campus instructional space.

Section 4

Instructional Room Inventory & Issues

Introduction

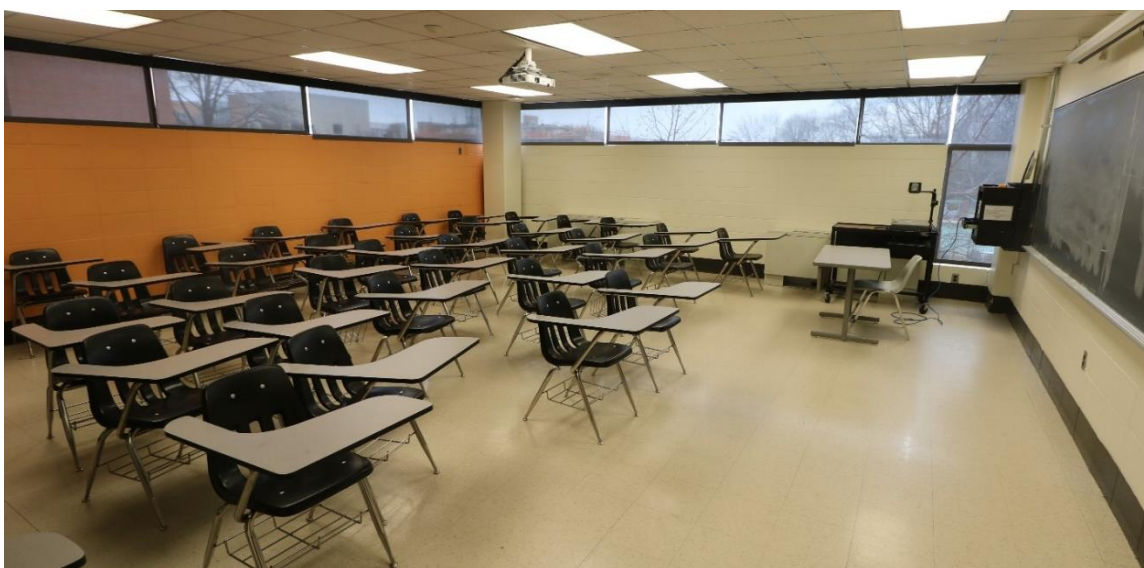
Instructional rooms are key to delivering UMBC's academic programs and strategic focus on innovative curriculum and pedagogy. This section reviews how well existing instructional rooms support University and student needs in terms of quality, typology and utilization.

Instructional Room Quality and Typology

Through the efforts of the Provost, Classroom Committee, Facilities Management, Division of Information Technology and others, the University has developed and is implementing multi-year cyclical plans to refresh and improve the centrally controlled classroom pool.

Recent work includes repair and refurbishing of older tablet arm chairs and adding accent wall colors to classrooms. In terms of technology, all central classrooms and computer labs are now equipped for instructor laptop connectivity and projection capacity. The University is moving towards BYOD.

The 2018 – 2022 Classroom Renewal Plan encompasses purchasing new classroom furniture, refurbishing existing furniture, removing equipment no longer used (e.g. overhead projectors), and renovations to adjust room capacities and introduce more flexible configurations to create active learning classrooms.



Stakeholder Comments on Classrooms

- Classroom quality issues:
 - rooms that lack flexible furniture to support reconfiguration for group work activities
 - furniture not appropriate for classes serving students who are working professionals
 - seats too small for students
 - rooms with columns that obstruct sightlines
 - rooms with inappropriate configurations – e.g. long and narrow so students at the back cannot see or hear the instructor
 - rooms that are too hot
 - rooms where the A/V equipment requires upgrading including lack of smartboards
 - projector screens that block whiteboards
 - computer systems that take too long to set up and/or wake up
 - increasing power requirements for in-class laptop use
 - general dissatisfaction with quality of unrenovated rooms in older buildings

- Classroom typologies:
 - Faculty keen for greater access to active learning classrooms (will be provided by ISLB)
 - Faculty not keen on active learning classrooms – do not like that students have their backs turned to the instructor
 - Concern around “consistent loss” of higher capacity classrooms due to conversion to active learning typology (e.g. 65 seats to 50 seats)
 - Desire for more seminar rooms with moveable seats that support small group discussions
 - Desire for more informal teaching spaces where students can work together on projects, study, etc.
- Classroom maintenance:
 - chairs missing even in the first class of the morning
 - furniture broken so capacity listing is incorrect
 - classroom computers /technology that does not work
 - chalk, markers, erasers, remotes not present
 - cleaning deficiencies
 - time consuming to request tech support
 - unclear mechanism to report problems – has led to situations where Departments purchase equipment for centrally-controlled classrooms
- “More and more” faculty refuse to work in rooms without 2 doors due to active shooter concerns

Stakeholder Comments on Teaching Labs

- CBEE reports its departmental laboratory is inadequate as it does not have ventilation.
- Paramedic program reports need for dedicated wet lab for medical skills training using high-fidelity clinical simulations involving biohazardous material.

Instructional Room Preferences of Students

During the Student Focus Group meeting, a range of different classroom furniture types and configurations were discussed using a 7-page handout with descriptions and images of exemplar rooms. Among this small sample group of students, there was some variation in opinion about several of the room types but unanimous agreement about the following:

- Dislike of traditional style classrooms furnished with tablet arm chairs
- Strong preference for all types of collaboration and active learning type classrooms, particularly the following exemplar groupwork configurations. Positive comments on UMBC's existing active learning classrooms – e.g. CASTLE



Instructional Room Utilization Analysis Results Summary

The *Utilization Analysis Report, January 9, 2019* provides a detailed assessment of instructional room utilization. Document highlights are described below. (Text below updated)

Classroom Inventory Overview

Classroom area per seat allocations at UMBC are generally aligned with the guidelines recommended by the Consultant Team. The average allocation per seat across all classrooms on the main campus is 18.7 NASF/station.

Classroom Utilization

An analysis of classroom utilization indicates unused capacity within the classroom pool across the scheduling week.

Specific results include:

- Highest use in Fall semester (2017 data) with the following rates of use based on a 45-hour scheduling window (8am – 5pm, Monday – Friday):

Centrally Scheduled Classroom Daytime Utilization Rate (82 rooms):	56%
Locally Scheduled Classroom Daytime Utilization Rate (45 rooms):	33%
Overall Average (127 rooms)	48%

Note that the figures for locally-controlled classrooms do not account for non-course room uses such as dissertation practice, departmental events, etc. For reference, the Consultant Team recommends that an institution consider adding classroom space to its classroom inventory when approaching a utilization rate of 80%.

- Large capacity rooms have the highest rates of utilization with all 100+ seat room categories showing daytime utilization rates of between 66% and 78% (Fall 2017 + Spring 2018). In this respect, the upcoming addition of four large classrooms in the Interdisciplinary Life Sciences Building is timely.
- Time-of-day graphics show the proportion of classrooms in use out of the total rooms available across each hour of the day (7AM – 10PM) and each day of the week (see page 3-21):
 - overall pattern is typical of a large institution with high activity between 10AM and 4PM
 - high rates of scheduled use seen through late afternoon and early evening is unusual and is due to the popular 150-minute period offered from 4:30 – 7PM
 - low utilization in the early mornings; on Fridays, particularly Friday afternoons; and during the Monday, Wednesday, Friday mid-day common hour
 - on average, 38% of small classrooms, 53% of medium classrooms, and 75% of large classrooms were scheduled during the daytime scheduling window (8:00 AM to 5:00 PM) indicating a strong demand for large classrooms
- A review of seat utilization shows a high proportion of activity scheduled for which classroom capacity exceeds class section size (66% in Fall 2017).
- The analysis describes an 'optimal classroom pool' - the number of rooms and capacity complement required to support actual scheduled activity in Fall 2017 and Spring 2018 using a utilization target of 80%. Comparison of the optimal pool to the existing complement of rooms shows a significant notional surplus of classrooms, and latent capacity in unused seats. The addition of 12 rooms in the ILSB will increase the overall surplus.

Laboratory Utilization

An analysis of teaching lab utilization describes daytime utilization organized by lab category for both Fall 2017 and Spring 2018 semesters with a small number of rooms exceeding the recommended target utilization rate of 60%.

Concluding Remarks

The Utilization Analysis demonstrates that UMBC's main campus has sufficient instructional room inventory to meet academic delivery needs and accommodate future enrollment growth. The primary pressure point is the supply of large classrooms and lecture halls which will be alleviated with the addition to the inventory of 4 new large teaching spaces (as well as 4 seminar and 4 medium active learning rooms) in the new ILSB in 2019.

The results further indicate that the scheduling challenges and frustrations faced at UMBC must be due to constraints imposed by scheduling practices, policies and tools and culture. If the University is able to make adjustments and enhancements to the scheduling enterprise, stakeholder frustrations and schedule quality outcomes will be improved. Further it may be possible to consider repurposing some instructional inventory to other high priority needs. For example, some surplus classrooms could be converted in the future to departmental use as collaboration / project / student meeting space or research space.

The University is making steady progress on renewing and updating the quality of instructional space through multi-year plans and introducing new types of learning environments such as active learning spaces. A planning direction in the next section outlines a strategy for improving the useability of instructional spaces and the matching of pedagogical needs to room characteristics during the scheduling process. Demand planning will support the 'right-sizing' of the inventory to match the number of rooms and their capacities for academic delivery needs.

Section 5

Planning Directions

Planning Directions to Address Issues Identified

UMBC is dedicated to providing its faculty with the tools, resources and facilities needed to deliver education that supports student success. Sections 3 and 4 of this report list issues revealed during the consultations and analysis related to scheduling and instructional room inventory that are hindering this goal.

It is important to bear in mind that, overall, scheduling is a successful enterprise at UMBC in that courses are delivered and students are supported in completing their programs of study within recommended timelines. However, high demand for certain classroom types at certain times of the academic week is challenging the capacity of the existing scheduling system to accommodate all requests. The result is that staff in many Academic Departments find the scheduling process to be labor-intensive, frustrating and stressful, and issues such as unplaced courses, competition for lecture halls and course delivery changes made to ‘make the current system work’ are starting to compromise optimal learning delivery and student access to courses. Ironically, overall utilization of instructional space on campus is low. This implies that scheduling practices not space shortages are impeding scheduling at UMBC.

These findings point to the need for UMBC to review its scheduling policies, practices and tools to identify ways and means of improving processes and outcomes, particularly since the University expects continued enrollment growth which will make existing scheduling challenges more acute over time (with a reprieve resulting from the addition of new instructional space in the ILSB in 2019).

This section identifies the following Planning Directions for consideration by UMBC:

A. Investigate Scheduling Authority Model Options
B. Review Scheduling Policies, Processes, Timelines and Staffing Levels
C. Review Options to Enhance Flexibility within the Standard Time Grid
D. Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements
E. Research Scheduling Software Systems

Notes

- The Planning Directions are offered not as prescriptive recommendations but as topics that the University may wish to explore. The intent is to identify and assess a range of options, best practice, precedents from peer institutions, merits / risks in light of UMBC goals, conditions, culture, etc. The University may wish to utilize existing committees and/or convene working groups to study the Planning Direction topics and develop recommendations for consideration by UMBC leadership.
- Any consideration of changes to scheduling practices and tools must be carried out with very careful planning. As a mission critical function, it is vital that ongoing scheduling processes and outcomes are not disrupted. UMBC should expect that the planning and implementation of improvements to scheduling will take at least 2 to 3 years.
- Part of the complication of improving a scheduling enterprise is the interconnectedness of elements. Making changes to one aspect of scheduling practice may not result in positive outcomes unless accompanied by changes to other aspects. Implementation planning must take into consideration these interconnections through careful integration, sequencing and pilot testing of any changes.

Planning Direction A Investigate Scheduling Authority Model Options	
Issues	<ul style="list-style-type: none"> • UMBC has a decentralized scheduling model for locally-controlled classrooms and teaching labs and a hybrid scheduling model for centrally-controlled classrooms. • For centrally-controlled classrooms, responsibility for room assignments, time of delivery and section size is split between the RO and Academic Departments resulting in a high number of unplaced courses which neither side can easily resolve. Academic Department staff are responsible for finding room assignments for unplaced courses and face high stress, tight timelines and inadequate tools. • It is understood that academic stakeholders hold strong views around maintaining scheduling authority and oversight of local teaching space. However, the scheduling challenges faced by the University as a result of the hybrid model now in place point to the need to review options to determine if alternative approaches might be beneficial. It is emphasized that the intent is not to take space away from Academic Departments.
Areas for Exploration by UMBC	<ul style="list-style-type: none"> • Review the merits of different scheduling models that can reduce the constraints on scheduling authority that are currently hindering efficient and effective scheduling. Models / strategies for investigation can include, for example: <ul style="list-style-type: none"> · <u>Fully decentralized</u> - Colleges / Schools assigned local control over the full inventory of teaching space required to deliver their programs and activities based on verified analysis of need · <u>Shared decentralized</u> - Colleges / Schools have priority use of certain teaching spaces with mechanisms/tools in place that allow use by other academic units once priority college / school needs have been met · <u>Status quo adjusted</u> – Colleges / Schools retain local control of teaching labs and low capacity classrooms while RO controls scheduling of large classrooms and lecture halls. For the latter spaces, key change is that Departments provide the RO with detailed information on course delivery attributes - pattern of delivery, learning environment typology, section size, etc. instead of exact time of delivery, specific room number, etc. University's new course scheduling software generates schedules that achieve Department goals for delivery and balance competing demands for high capacity classroom space. · <u>Fully centralized</u> - All teaching space is scheduled centrally with new scheduling software enabling Departments to achieve desired delivery goals through specification of a full range of delivery attributes
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> • Improved scheduling success – e.g. elimination of unplaced courses, minimization of course conflicts, no need for LH meeting, optimization of schedule quality for students and faculty, improved room utilization, etc.
Inter-dependencies	<ul style="list-style-type: none"> • Scheduling practices and timelines, staffing for scheduling

Planning Direction B Review Scheduling Policies, Processes, Timelines and Staffing Levels	
Issues	<ul style="list-style-type: none"> • Current UMBC scheduling policies are not comprehensive. • The Study has revealed challenges facing scheduling processes and timelines that warrant review and adjustment.
Areas for Exploration by UMBC	<ul style="list-style-type: none"> • Revise/ expand UMBC scheduling policies. Consider addressing, for example: <ul style="list-style-type: none"> · Scheduling mission statement, quality objectives for student schedules and faculty schedules · Standard time patterns · Policies around scheduling priorities and allowable constraints · Guidelines for scheduling of events and ad hoc activities · Guidelines on instructional space management, roles and responsibilities, etc. · Instructional space utilization targets · Other • Revise scheduling processes, as appropriate to: <ul style="list-style-type: none"> · Address changes stemming from work on Planning Directions A-D · Address issues identified during Study (Sections 3 and 4) and through other means. • Review scheduling timelines collaboratively with academic stakeholders to optimize scheduling task durations and deadlines, meet registration targets for students, and minimize changes after student schedules are published. • Review staffing levels to ensure adequate resources are in place to support the vital scheduling enterprise. • Consider developing mechanisms to collect information on scheduling quality outcomes, student and faculty priorities to inform scheduling planning and practices.
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> • More effective and efficient scheduling process, reduced staff workloads and stress, enhanced quality schedules and student access to courses.
Inter-dependencies	<ul style="list-style-type: none"> • Planning Directions A - D

Planning Direction C Review Options to Increase Flexibility within the Standard Time Grid	
Issue	<ul style="list-style-type: none"> UMBC's current standard times were set in 2005. It is timely for the University to review the established block patterns in light of changes stemming from evolving course delivery modes and patterns, pressure points within existing grid, etc.
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Research standard time models in use at universities similar in profile to UMBC Understand priorities of the UMBC academic community for patterns of course delivery that optimize learning and student success Understand student preferences for patterns of course delivery and quality schedules Review the University's free hour policy by considering alternate models such as: <ul style="list-style-type: none"> reduce the number of free hours per week change day/designated time of free hour to non-peak timeslots alter the reach of free hour – e.g. 1 institution-wide free-hour complemented by college/school specific free hours Consider ways the weekly scheduling grid can be structured to accommodate standard times. E.g. An hourly scheduling grid can support 1, 2 or 3 period delivery patterns at any time of day
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Increase flexibility in the delivery of 50-minute, 75-minute and 150-minute periods with particular attention to expanding options for the delivery of 75-minute and 150-minute periods Tamp down peak demand by distributing delivery pattern options across the scheduling week Enhance conflict-free access to general education and elective courses Lessen disadvantage for programs and courses that do not conform to established standard times Promote improved room utilization on Fridays and early mornings Support continued strong utilization of late afternoon and early evening timeslots
Inter-dependencies	<ul style="list-style-type: none"> N/A

Planning Direction D	Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements
Issues:	<ul style="list-style-type: none"> The instructional room inventory at UMBC is being adapted and improved over time to address evolving pedagogical needs. Multi-year plans are in place to upgrade room quality; Colleges have developed innovative teaching spaces such as CASTLE and CALC; the new ILSB will provide state-of-the-art new teaching space. Since the current scheduling system does not allow specification of room typology during course loading, faculty are often scheduled into rooms that do not support intended pedagogy. The Utilization Analysis reveals low overall classroom utilization rates. This contrasts with user experiences of classroom shortages – e.g. unplaced courses, competition for lecture hall timeslots, mismatches between section size and classroom seats, etc. The latent capacity in the inventory can only be realized if improvements are made to scheduling practices and outcomes.
Areas for Exploration by UMBC	<ul style="list-style-type: none"> <u>Match instructional room inventory to pedagogies</u> – Develop recurring processes involving academic stakeholders (faculty, students, FDC) to assess ‘ideal’ teaching spaces that support best practice learning delivery and innovative pedagogies. Integrate recommendations into multi-year plans for upgrading of classroom pool. Consider refining definitions already in place to establish a limited number of ‘standard’ classroom types for UMBC detailing key room features and qualities such as furniture type and configuration, technology and equipment. Such standards will help schedulers match room requests to inventory and will allow faculty to know what to expect when given room assignments. Course scheduling software will allow Academics to request specific room typologies during course loading leading to room assignments that better match desired learning delivery modes. <u>Right-size the instructional room inventory</u> – Develop data-driven analysis tools to assess/predict demand for instructional space. Use this information to drive ongoing assessment and adjustment of classroom inventory to match demand in terms of number of rooms and seat capacity. <u>Develop mechanisms and/or identify tools to more easily share information</u> on the availability of instructional space among RO, Academic Departments and other stakeholders.
Issues Potentially Addressed	<ul style="list-style-type: none"> Better matching of learning delivery modes to classrooms, supporting quality teaching and learning, and innovation in pedagogy. Better matching of section sizes to room capacities If scheduling issues can be successfully addressed, the University will be in a position to realize latent capacity in the instructional space inventory. This can include, for example, repurposing some rooms for other uses – e.g. creation of collaboration space, expansion of research space, etc.
Inter-dependencies	<ul style="list-style-type: none"> Improved course scheduling software. Scheduling practices, timelines, staffing.

Planning Direction E Research Scheduling Software Systems	
Issue	<ul style="list-style-type: none"> UMBC uses 25Live® Event Planning software by CollegeNet which is not purpose-designed for course scheduling and lacks the full scope of options, algorithmic power and user-friendly interfaces of dedicated course scheduling software.
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Research the attributes of scheduling enterprise software systems (offering course, event, examination, etc. components), particularly Schedule 25 by CollegeNet which UMBC already licences, to understand the advantages to the University of available course scheduling software options.
Potential Outcomes / Issues Addressed	<ul style="list-style-type: none"> Improve scheduling success – e.g. potential elimination of unplaced courses, minimization of course conflicts, optimization of schedule quality for students and faculty, improved room utilization Improve utility of course loading interfaces through capacity to define a broad range of course delivery parameters (e.g. prerequisites / co-requisites, delivery patterns such as lecture before lab, maximum gap between classes for students, etc.) allowing software algorithm to prioritize and balance needs across all academic activities Ability to encode room attributes and match to pedagogy – e.g. active learning room, case study room, dance studio, etc. Reduce manual labor required throughout scheduling process No need for term roll, improving equity of access to space No need for lecture hall meetings Improve match between course section size and room capacity Ability to prioritize campus precinct in room location assignments Improve access to information on schedules and available rooms Predictive analytics capacity to forecast instructional space requirements based on projected academic activity Post-scheduling analytics to assess schedule quality, room utilization rates, etc. Note: Compatibility with other corporate software, particularly Peoplesoft® is vital
Potential Strategies	<ul style="list-style-type: none"> Review software systems on the market, vendor demonstrations, etc., particularly Schedule 25 Poll peer institutions for advice on ‘lived experience’ with software As an implementation strategy, run new software for one semester or more in parallel to existing system to demonstrate viability, test outcomes and gain stakeholder confidence prior to going live with the new product
Inter-dependencies	<p>Even the most powerful scheduling software cannot ‘do its job’ if the constraints placed by course loading are so restrictive that the algorithm cannot function as designed. Changes resulting from the following planning directions will impact the efficacy of any new scheduling software at UMBC:</p> <ul style="list-style-type: none"> Scheduling model, particularly authority for specifying time of course delivery Standard times Scheduling practices and timelines Enhanced RO staff resources to operate and manage software and associated scheduling practices

Appendices

Acronyms

BYOD	Bring Your Own Device
CADVC	Center for Art, Design and Visual Culture
CAHSS	College of Arts, Humanities & Social Sciences
CALC	CNMS Advanced Learning Collaboratory
CBEE	Chemical, Biochemical and Environmental Engineering
CDC	Course Demand Committee
CNMS	College of Natural and Mathematical Sciences
COEIT	College of Engineering & Information Technology
CSEE	Computer Science & Electrical Engineering
DoIT	Division of Information Technology
DPS	Division of Professional Studies
EHS	Emergency Health Services
ELI	English Language Institute
FDC	Faculty Development Center
FM	Facilities Management
FTE	Full Time Equivalent – measure of student enrollment
FTDE	Full Time Day Equivalents -measure of student daytime enrollment
FTNE	Full Time Night Equivalents – measure of student evening enrollment
GEP	General Education Program
GES	Geography & Environmental Systems
GSA	Graduate Student Association
GWST	Gender and Women’s Studies
ILSB	Interdisciplinary Life Sciences Building (currently under construction)
INDS	Interdisciplinary Studies
IRADS	Institutional Research, Analysis & Decision Support
IS	Information Systems
IT	Information Technology
LH	Lecture Hall
LLC	Language, Literacy & Culture
LRC	Learning Resources Center
M/W/F	Monday/ Wednesday/ Friday
MCS	Media & Communication Studies
MLLI	Modern Languages, Linguistics & Intercultural Communication
NASF	Net Assignable Square Feet
OUE	Office of Undergraduate Education
PHED	Physical Education
REX	Report Exchange UMBC’s data warehouse containing organized data from the university’s administrative systems for analysis and reporting. Integrated with RT. Allows departments to examine data from submitted help tickets.
RO	Registrar’s Office
RT	Request Tracker Customizable open source software used to keep track of tasks, issues, information and campus collaboration using request tickets
SA	Student Administration
SC	Scheduling Coordinator
SAHAP	Sociology, Anthropology and Health Administration & Policy
SGA	Student Government Association
SLC	Science Learning Collaboratory
SOC	Schedule of Classes
T/R	Tuesday/ Thursday
TA	Teaching Assistant
UAA	Division of Undergraduate Academic Affairs
UPD	Undergraduate Program Directors

Appendix B

Consultation Participants

The following table lists the meetings held during the Instructional Space & Scheduling Study between April and August 2018. Stakeholder meetings were led by the consultant team.

Date/Time	Participant	Position
Office of the Provost		
2018 04 11 9AM – 10 AM	Antonio Moreira	Vice Provost, Academic Affairs
	Connie Pierson	Associate Vice Provost, IRADS
	Yvette Mozie-Ross	Vice Provost, Enrollment Management & Planning
	Julianne Simpson	Director of Planning, Facilities Management
Institutional Research, Analysis and Decision Support (IRADS)		
2018 04 11 10:30 - 11:30	Connie Pierson	Associate Vice Provost, IRADS
	Kevin Joseph	Director, Business Intelligence, Division of Information Technology (by phone)
	Michael Glasser	Director, IRADS (by phone)
	Pam Hawley	University Registrar
	Antonio Moreira	Vice Provost, Academic Affairs
	Tracey Musick	Coordinator, Institutional Research
	Julianne Simpson	Director of Planning, Facilities Management
Student Focus Group		
2018 04 11 12PM – 1PM	Brandon Liu	Student, Biological Sciences & Animation / Junior
	Deanna Cerquetti	Student, Graduate Student Associate Senate / Language & Literacy Culture Graduate Student
	Joshua Massey	Student, Computer Engineering / Senior
	Julianne Simpson	Director of Planning, Facilities Management
	Kevin Louis	Student
	Mariam Abalo-Toga	Student, Physics / Freshman
	Markya D. Reed	Student, Psychology / Social Work / Senior
	Miles Hunter	Student, Biological Sciences / Junior
	Nova DasSarma	Student, Information Systems / Senior
	Roy Prouty	Student, Computer Science / Graduate Student
	Zane Poffenberger	Student, History & Political Science / Freshman
	Julianne Simpson	Director of Planning, Facilities Management
Central Scheduling Team		
2018 04 11 1:30 – 2:50PM	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Edyta Edwards	Program Specialist, Summer, Winter & Special Programs, Professional Programs
	Jill Eigenbrode	Assistant Registrar, Catalog
	Pam Hawley	University Registrar
	Julianne Simpson	Director of Planning, Facilities Management
Classroom Committee		
2018 04 11 3 – 3:55PM	Amy Heckhaus	Operations Manager, Dean's Office, COEIT
	Cassie Hoddinott	Director, Learning Resources Center
	Celso Guitian	Campus Planner, Facilities Management
	Connie Pearson	Associate Vice Provost, IRADS
	David Toothe	Associate Director, Information Technology / AV Services
	Deanna Cerquetti	Student, Graduate Student Associate Senate / Language & Literacy Culture Graduate Student
	Dennis Cuddy	Business Manager, Administration & Facilities, Chemistry & Biochemistry
	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Edyta Edwards	Program Specialist, Summer, Winter & Special Programs, Professional Programs
	Jill Randles	Assistant Vice Provost and Assistant Dean, Office of Undergraduate Education
	Pam Hawley	University Registrar
	Steve Anderson	Manager, Instructional Technology, Information Technology
	Tawny McManus	Assistant Vice Provost for Accessibility, Student Disability Services
	Antonio Moreira	Vice Provost, Academic Affairs
	Julianne Simpson	Director of Planning, Facilities Management

Appendix B

Consultation Participants

Date/Time	Participant	Position
Provost / VP F&A		
2018 04 11 4 – 4:20PM	Lynne Schaefer	Vice President, Administration & Finance
	Philip Rous	Provost and Senior Vice President, Academic Affairs
	Julianne Simpson	Director of Planning, Facilities Management
Facilities Management		
2018 04 11 4:30 – 5PM	Celso Guitian	Campus Planner, Facilities Management
	Heather Bishop	Facilities Planner, Facilities Management
	Julianne Simpson	Director of Planning, Facilities Management
Academic College Stakeholders		
2018 04 12 9 – 10:30AM	Alan Yeakley	Graduate Program Coordinator, Geography & Environmental Systems
	Carla Ison	Scheduling Coordinator, History
	Carol Haemon	Administrative Assistant II
	Carolyn Forestiere	Chair, Political Science
	Connie Bailey	Scheduling Coordinator Music
	Dennis Cuddy	Business Manager, Administration & Facilities, Chemistry & Biochemistry
	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Elaine O'Heir	Scheduling Coordinator, Psychology
	Erin Minnigh	Administrative Assistant II, American Studies
	Janet Burgee	Coordinator, Mathematics & Statistics
	Jean Fernandez	Professor, English
	Jennifer Maher	Undergraduate Program Director, English
	Jill Eigenbrode	Assistant Registrar, Catalog
	Jill Randles	Assistant Vice Provost and Assistant Dean, Office of Undergraduate Education
	Joe School	Scheduling Coordinator, Geography & Environmental Systems
	John Stolle-McAllister	Associate Dean, Student & Curricular Affairs, CAHSS
	Linda Dusman	Chair, Music Department
	Marion Emmert Evans	Academic Program Specialist-Scheduling, Registrar's Office
	Marjoleine Kars	Chair, History
	Melissa Rose	Program Management Specialist, SAHAP
	Melody Wright	Business Services Specialist
	Nafi Mirabueadian	Administrative Assistant II
	Pam Hawley	University Registrar
	Paul Ciotta	Technical Coordinator, Physics
	Renee Decker	Emergency Health Services Administrative Assistant / Graduate Program Coordinator
	Richard Chang	Associate Chair, Computer Science & Electrical Engineering
	Ryan Sheldon	Assistant Director, English Language Institute
	Sarah Gardenghi	Director, English Language Institute Non-Credit Programs
	Scott Casper	Dean, College of Arts, Humanities & Social Sciences
	Sonya Crosby	Division of Professional Studies, Professional Programs
	Steve Young	Associate Chair, Scheduling Coordinator, Modern Languages, Linguistics and Intercultural Communication
	Susan Sterett	Chair, Public Policy
	Terry Worchesky	Associate Chair, UPD, Physics
	Tim Lynch	Assistant Director, Summer, Winter and Special Programs
	Antonio Moreira	Vice Provost, Academic Affairs
	Trisha Wells	Assistant Vice Provost, Administration & Finance, Division of Professional Studies
	Julianne Simpson	Director of Planning, Facilities Management
Division of Information Technology		
2018 04 12 11 – 12PM	John Fritz	Associate Vice President, Information Technology
	Steve Anderson	Manager, Instructional Technology, Division of Information Technology
	Julianne Simpson	Director of Planning, Facilities Management

Appendix B

Consultation Participants

Date/Time	Participant	Position
Faculty Senate		
2018 04 12 12 – 1PM	Amy Everhart	Information Systems
	Antonio Moreira	Vice Provost, Academic Affairs
	Diane Alonso	Program Director, Psychology, Shady Grove Campus
	Doug Hamby	Associate Professor, Dance
	Elizabeth Patton	Assistant Professor, Media and Communication Studies
	Erle Ellis	Professor, Geography & Environmental Systems
	Jessica Berman	Director and Professor, English
	Joanna Gadsby	Reference Librarian
	Joel Liebman	Professor, Chemistry & Biochemistry
	Julianne Simpson	Director of Planning, Facilities Management
	Pam Hawley	University Registrar
	Renee Lambert-Bretiere	Modern Languages, Linguistics & Intercultural Communication
	Julianne Simpson	Director of Planning, Facilities Management
Advisory Group		
2018 04 12 1:30 – 2:30PM	Antonio Moreira	Vice Provost, Academic Affairs
	Dennis Cuddy	Business Manager, Administration & Facilities, Chemistry & Biochemistry
	Elaine O'Heir	Scheduling Coordinator, Psychology
	Pam Hawley	University Registrar
	Paul Dillon	Deputy Chief of Police, UMBC Police Department
	Richard Chang	Associate Chair, Computer Science & Electrical Engineering
	Yvette Mozie-Ross	Vice Provost, Enrollment Management & Planning
	Julianne Simpson	Director of Planning, Facilities Management
Central Scheduling Team		
2018 04 12 2:30 – 3:30PM	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Pam Hawley	University Registrar
	Julianne Simpson	Director of Planning, Facilities Management
Steering Committee		
2018 05 16 11:15 – 12:15PM	Antonio Moreira	Vice Provost, Academic Affairs
	Jack Suess	Vice President of Information Technology
	John Stolle-McAllister for Scott Casper	Associate Dean, Student & Curricular Affairs, CAHSS
	Katharine Cole	Vice Provost and Dean, Undergraduate Academic Affairs
	Keith Bowman	Dean, COEIT
	Lynne Schaefer	Vice President, Administration & Finance
	Julianne Simpson	Director of Planning, Facilities Management
CAHSS Chairs and Directors		
2018 05 16 12:30 – 2PM	Antonio Moreira	Vice Provost of Academic Affairs
	Bev Bickel	Interim Chair, Language, Literacy & Culture
	Carol Hess	Chair, Dance Department
	Carole McCann	Chair, Gender & Women's Studies
	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	John Stolle-McAllister	Associate Dean, Student & Curricular Affairs, CAHSS
	Marjoleine Kars	Chair, History
	Melissa Rose	Program Management Specialist, SAHAP
	Pam Hawley	University Registrar
	Rebecca Boehling	Director, Judaic Studies / Global Studies
	Steve Yalowitz	Chair, Philosophy
	Julianne Simpson	Director of Planning, Facilities Management
Classroom Committee & Advisory Group		
2018 05 16 3:30 – 5PM	Celso Guitian	Campus Planner, Facilities Management
	Collin Sullivan	President, SGA
	Dennis Cuddy	Business Manager, Administration & Facilities, Chemistry & Biochemistry
	Douglas Lamdin	Scheduler, Professor of Economics
	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Edyta Edwards	Program Specialist, Summer, Winter & Special Programs, Professional Programs

Appendix B

Consultation Participants

Date/Time	Participant	Position
	Elaine O'Heir	Scheduling Coordinator, Psychology
	Linda C Hodges	Director, Faculty Development Centre
	Michael Glasser	Director, Decision Support, Institutional Research
	Pam Hawley	University Registrar
	Richard Chang	Associate Chair, Computer Science & Electrical Engineering
	Julianne Simpson	Director of Planning, Facilities Management
COEIT Chairs and Directors		
2018 05 17 9 -10AM	Amy Heckhaus	Operations Manager, Dean's Office, COEIT
	Anupam Joshi	Chair, Computer Science & Electrical Engineering
	Aryya Gangopadhyay	Chair, Information Systems
	Chuck Smithson	Program Management Specialist, Mechanical Engineering
	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Fabiola Attime	Program Management Specialist, CBEE
	George Karabatis	Associate Chair, Information Systems
	Jamie Gurganus	Associate Director, Mechanical Engineering
	Lina Chung	Program Management Specialist, Information Systems
	Mark Marten	Chair, Chemical, Biochemical and Environmental Engineering
	Richard Chang	Associate Chair, Computer Science & Electrical Engineering
	Julianne Simpson	Director of Planning, Facilities Management
Academic Affairs, Colleges, Schools		
2018 05 17 11-12:30PM	Cassie Hoddinott	Director, Learning Resources Center
	Chris Murphy	Chair, Psychology
	Edyta Edwards	Program Specialist, Summer, Winter & Special Programs, Professional Programs
	Eric Brown	Program Coordinator, Interdisciplinary Studies
	Galina Madjaroff	Associate Dean for Academic Affairs, Erickson School
	J Lee Jenkins	Chair, Emergency Health Services
	Jean Fernandez	Professor, English
	Jill Randles	Assistant Vice Provost and Assistant Dean, Office of Undergraduate Education
	Jodi Kelber-Kaye	Associate Director, Honors College
	Jon Singer	Chair, Education
	Katharine Cole	Vice Provost and Dean, Undergraduate Academic Affairs
	Melanie Berry	Undergraduate Program Director, Visual Arts
	Pam Hawley	University Registrar
	Preminda Jacob	Chair, Art History & Museum Studies, Visual Arts
	Ryan Sheldon	Assistant Director, English Language Institute
	Trisha Wells	Assistant Vice Provost, Administration & Finance, Division of Professional Studies
	Julianne Simpson	Director of Planning, Facilities Management
CNMS Chairs		
2018 05 17 1 – 2:30PM	Drema Wentz	Associate Registrar, Scheduling, Catalog & Faculty Services
	Mike Hayden	Chair, Physics
	Pam Hawley	University Registrar
	Philip Farabaugh	Chair, Biological Sciences
	Rouben Rostamain	Chair, Mathematics & Statistics
	Terry Worchesky	Associate Chair, UPD, Physics
	Zeev Rosenzweig	Chair, Chemistry & Biochemistry
	Julianne Simpson	Director of Planning, Facilities Management
Project Steering Committee (by teleconference)		
2018 07 12 3 – 4 PM	Keith Bowman	Dean, College of Engineering & Information Technology
	Katharine Cole	Vice Provost and Dean, Undergraduate Academic Affairs
	Bill LaCourse	Dean, College of Natural and Mathematical Sciences
	Antonio Moreira	Vice Provost of Academic Affairs
	Janet Rutledge	Vice Provost and Dean of the Graduate School
	Lynne Schaefer	Vice President of Administration and Finance
	John Stolle-McAllister for Scott Casper	Dean, College of Arts, Humanities and Social Sciences
	Julianne Simpson	Director of Planning, Facilities Management

Consultation Participants

Date/Time	Participant	Position
Project Steering Committee (by teleconference)		
2018 08 09 10:30 – 11:30AM	Antonio Moreira	Vice Provost of Academic Affairs
	Philip Rous	Provost and Senior Vice President, Academic Affairs
	Lynne Schaefer	Vice President of Administration and Finance
	Sarah Shin	Associate Provost for Academic Affairs
	Jack Suess	Vice President of Information Technology
	Julianne Simpson	Director of Planning, Facilities Management
Faculty Senate Tea		
2018 11 05 4:15 – 5PM	Members of the Faculty Senate	

UMBC Instructional Space and Scheduling Review Questionnaire

Project Context

The University of Maryland, Baltimore County (UMBC) is assessing current practices, policies and procedures regarding the current allocation and scheduling of instructional spaces at its main campus to identify opportunities for improvement and recommendations that foster scholarly excellence and best and highest use of space. The Review will look at scheduling quality factors for students and faculty and strategies for supporting good utilization and equitable access to instructional space as a valuable institutional resource.

About Educational Consulting Services Corp.

Educational Consulting Services Corp. (ECS) provides consulting services to higher education institutions and agencies to develop buildings, campuses, policies, and planning tools that foster quality teaching, learning, and research. UMBC has retained ECS to assess current scheduling processes, provide scheduling and policy exemplars, and propose recommendations to strengthen scheduling practices and policies.

QUESTIONS

1. Scheduling Policy, Process and Timelines

The development of schedules entails coordination, collaboration and sometimes compromise between the many academic and administrative units of a university. Policies, processes and timelines influence how schedules are developed and how satisfactory they are to all stakeholders concerned.

Please comment on the policy framework, processes and timelines in place at UMBC regarding the development of schedules each semester.

2. Room Capacity and Room Type Constraints

One critical aspect of the complex scheduling task is identifying and coordinating the availability of students, faculty and space in a way that meets course and program delivery requirements, minimizes conflicts and generates quality timetables. As one of the three elements, instructional spaces are often a common resource shared by many users.

- There is a collaborative process in place at UMBC to resolve conflicts around the scheduling of **lecture halls**. Please comment on how this approach meets your needs (if applicable).
- Please comment on the availability of **other types of instructional spaces** (seminar rooms, classrooms, labs, studios, etc.) and their seat capacities to meet the scheduling requirements of your program(s).

3. Inter-Departmental / Inter-Faculty Coordination

Many academic departments offer pre-requisite, co-requisite or general education courses that are required or are of interest to a broad segment of the University's student population. The days and the times when such courses are scheduled can be challenging to coordinate within and across departments and faculties.

Please comment on this aspect of developing course schedules at UMBC.

4. Scheduling Blocks

UMBC uses a standard scheduling block grid whereby:

- 50-minute classes are scheduled on Monday, Wednesday and Friday
- 75-minute classes are scheduled on Tuesday and Thursday

There are exceptions to the above (e.g. 75- minute standard blocks on Monday and Wednesday afternoons, 150 minute time blocks Monday through Thursday beginning at 7 pm), but generally the schedules developed each semester adhere to this overall weekly grid.

Please comment on how well this grid works for your department in terms of fostering learning outcomes, student attendance, faculty satisfaction and any other consideration deemed relevant.

5. Scheduling Teaching Laboratories

Teaching laboratory scheduling must consider many factors such as duration of lab delivery time (e.g. 3 hours), sequence of content delivery (e.g. classroom-based theory prior to lab experience), requirement for set-up and take-down time, student access for practice, etc.

If applicable, please comment on any challenges or issues your department faces in scheduling teaching laboratory spaces.

6. Other Comments

Please convey below any other comments, ideas or concerns related to UMBC scheduling practices and/or instructional space you would like to bring to the attention of ECS.

During the data collection phase of the Study, all meeting participants, whether students, faculty, administrators or university leaders, were asked to write down their ‘best’, ‘on the spot’ answer to the question: *What is a Quality Timetable?* This appendix records, unedited and in random order, all responses provided.

The word cloud below provides a measure of word count used in the responses with larger size words correlating to the frequency of occurrence in the responses.



Stakeholder Definitions – Student Responses

- To have classes I need to take for major to be completed within 4 years.
- All classes are blocked together, geographically close, tends to be small group classes.
- One that fully utilizes campus business hours Friday afternoons!
- A quality schedule is one in which a student is not forced to take a course that will be a detriment to other aspects of their life (access to transportation, ability to work, etc.)
- A schedule that has all classes and credit amounts for a semester with evenly spaced class times.
- A schedule that does not contain too many gaps (over $\sim 1 - 1.5$ hours) nor too few (more than 1 back to back class per day).
- A quality schedule is one that allows you to prepare for a class for an hour before it.

Stakeholder Definitions – What is a Quality Schedule?

- A quality schedule allows for appropriate living times (wake up, meals, sleep), comfortable spaces between class periods, and maintains space in the day for extracurriculars (student organization meetings, staff meetings, research, volunteering).
- One in which I have created from a diverse set of options and selected the optimal solution as far as course offerings, professor, and time in an appropriately styled classroom.
- A schedule that allows enough time to space out work, classes, mealtimes and breaks. Preferably this schedule would help the student move forward with their degree/program.

What is a Quality Schedule?

Stakeholder Definitions – Staff Responses

- Although I like the idea of having Friday 'free', I am convinced that courses should be given 9 – 5 M – F
- A schedule with flexibility
- A schedule that helps students and faculty work together most effectively for all involved
- Transparent to faculty; sections of courses available at various times of the day/week
- Long blocks of time AND space to do research
- Time, space and instructional delivery mode are optimized so teaching and learning outcomes are evaluated more than the logistics of where they occur.
- One that gets all the classes scheduled in an appropriate room in the timeframe planned.
- From a student point of view, how can I get classes when I want to take them so I can get all the classes I need in a semester
- Appropriately placed classes in the right kind of classroom from the get-go / Minimum placement of certain paths of courses to lessen needed courses offered at the same time or overlapping
- A schedule that meets the needs of the dept., faculty and students, providing a room, current technology and layout
- Allows students to have reasonable options and accommodate faculty needs, with respect to teaching/learning outcomes as well as personal life. / Students seem to increasingly need to fit course schedule around work needs. / Faculty, more and more of whom are adjunct, need to feel appreciated – having options with scheduling (including parking availability) is a large part of that
- A quality schedule acknowledges the teaching outcomes of students and the research and family needs of the faculty.
- A quality schedule for a given person allows her/him to balance all of their short-term and long-term goals and requirements without damaging the health and sense of wellbeing of that individual.
- Classroom furniture, equipment, A/V equipment must be updated. / Schedule must be built to accommodate the students, NOT faculty. Faculty childcare issues should remain the responsibility of the faculty /parent and not the department/University.

Stakeholder Definitions – What is a Quality Schedule?

- One that creates a cooperative schedule between dept, utilizes current space to full extent, meets student needs – including incoming students that enroll late who normally can't get any needed classes.
- Ensure that courses are scheduled in a way that the curriculum may be delivered without conflicts over appropriate spaces that too often need to be shared by too many.
- A schedule that corresponds with the learning objectives of different fields of study, different levels of student learning, etc.
- One that has classes at convenient times for faculty and students and can be produced efficiently.
- A quality schedule offers classes at various times throughout the day that meets the needs of faculty and students and provides adequate learning spaces to achieve learning outcomes.
- A schedule that allows me to complete all the requirement of my day with time to relax and take stock at the end of the day.
- One that utilizes teaching spaces such that they are evening distributed across days and times.
- The space accommodates the size and pedagogy of the course that supports students' degree completion.
- Quality schedule is a timetable that supports students' access to all their classes in a way that allows their timely graduation.
- From student point of view, how do I get classes when I need them so that I can graduate in time?
- A quality schedule is a schedule that provides students with needed and desired course options, instructors with appropriate teaching space, and that leverages a variety of times and modes of instruction to provide options.
- A good schedule is one in which all time blocks are being used in an equal of scheduled use with few empty blocks.
- One that utilizes the times that are best for learning that subject or do that process.
- The ability to satisfy scheduling needs of faculty and students.
- The instructor gets the room with the combination of characteristics that best fit their teaching methods.
- A schedule that offers classes 8am – 5pm M – F and maybe T / R evenings or combination of professional studies for more evening
- One that allows for consistent, free flow of traffic, pedestrian and vehicular throughout the day.
- Fully utilize the spaces and times available.
- A schedule which allows students to take required courses, meeting milestones with a minimum of grief.
- A schedule that provides students and instructors with the means by which they can get or provide the classes they need to complete their degree in a timely manner.
- It provides for the best student learning outcomes and progression to degree completion.

Stakeholder Definitions – What is a Quality Schedule?

- On behalf of students, choices of days and times for my required courses in a way that allows me to make timely progress toward my degree.
- Schedule that properly utilizes the facilities to their maximum utility.
- M – F 8 – 5 classrooms should be utilized 75% of the time, and class labs should be 67% of the time, with an emphasis on encouragement of Friday teaching, and classes should not be too late for safety reasons.
- A schedule that allows students to take the courses they need at times that work for them while also allowing faculty to teach at times that work for them (involving hours at which they are at their best & accommodate research and service demands and family demands) in the appropriate space the pedagogy of the course demands, with functioning computers, smartboards and TV screens !!
- I am in a program that holds classes in the evening only (4:30 and 7:10 start). We don't have the same problems. However, we would like to expand into the day with outreach to undergrads for full use of classroom space throughout the day, with students attending classes, whenever scheduled.
- Maximizes the use of space while accommodating best learning outcome infrastructure.
- Instructional schedule and space that enables the professor to provide the educational material and experience necessary for students to produce the necessary outcomes. This includes a schedule conducive for traditional and non-traditional students.
- A quality schedule is one that has assigned rooms when registration begins.
- Quality schedule is a schedule that with the compromise of all parties involved meets the needs of the #1 stakeholder, which is the student.
- One that takes into account student outcomes, student desires (schedule), while also fitting into faculty preferences (schedule, space). Our dept. must coordinate with other depts in our college to negate schedule conflicts with our student population. This process would be easier if we had an appropriate amount of space (i.e. best case scenario or 'in a perfect world'). A quality schedule also takes into account that not every course is 3 credits. Our dept. only offers 4 credit courses which do not meet a 'standard' 3 credit meeting pattern.
- A schedule which does not need to be revised because of lack of appropriate classrooms.
- A quality schedule is spread throughout the day, makes use of the given spaces and timeslots in an efficient and appropriate way while serving the needs of students and faculty in the process of learning and teaching.
- A quality schedule would be one where students had an array of classes to choose from 8:30 in the morning to 7pm in the evening and classes were not 'bunched' up in certain time blocks (i.e. 2:30 – 3:45 on MW). That there would be morning hours on MW (not MWF) and that all classes get rooms – appropriate rooms.
- Enough classrooms for all subjects to be taught from the smallest program to the largest department.
- Enough classrooms to hold all classes on campus. New scheduling system that is more efficient.

Stakeholder Definitions – What is a Quality Schedule?

- Enough spacious classrooms. Smart rooms with working and functional equipment. To be able to schedule classes within appropriate time schedule and accommodating student and faculty needs.
- One that equally considers and weighs all interested parties (departments, faculty and students). One that takes into account where the University is going, i.e. new schedules, methods, rather than set in old processes and approaches.
- One in which the classes are distributed throughout the week. One that considers a particular student's schedule so that the student does not end up having to take a class early morning and having to stay till the evening to another required class.
- Students and faculty get their kinds of spaces [lecture, active learning, lab, studio] that are appropriate for best learning outcomes.
- Every student gets the class he or she needs.
- There is no perfect schedule. A workable schedule should take into consideration all student needs and minimize delays in graduation.
- One where everyone is happy 😊
- For a faculty member who teaches more than one course, we want all courses to be on the same day and there to be something like one hour gap between the classes.
- If it doesn't lead to issues that a chair needs to think/resolve, then it is a quality schedule.
- All the courses and all the instructors are determined by Blackout and there is a requirement and accountability of chairs and faculty for this to happen.
- The one that satisfies the majority of student and faculty requests to over 90% rate.
- A quality schedule works for faculty, students and the university; (it currently works for no one).
- Flexible and able to predict demands effectively.
- - Meets the timetable (e.g. time constraints) of students and allows them to graduate on time (i.e. four years for freshmen; two years for transfer)
- - More 2.5 hour blocks during the day
- - A good distribution of courses throughout the week – including Monday mornings and Thursday evenings
- - Meets the faculty timetable so that they can block off time for research / teaching / service
- A schedule, with rooms for all our classes, set up by the university, at times that allow our students to take all necessary classes, in rooms that meet pedagogical needs.
- A schedule that can accommodate all classes on campus and that there is available space for every section.
- A schedule that accommodates the growth and matches the needs of the department and students. Follow ABET scheduling.
- Has the distribution in time and curriculum to meet the needs of the students and allows faculty to do research and get tenure
- One in which required courses do not overlap and courses are not cancelled or moved.

Additional Information on Planning Directions**Introduction**

This appendix expands on the Planning Directions set out in Section 5 by providing additional information such as options, opportunities, potential next steps, exemplars from peer institutions, etc. to support UMBC's future efforts to strengthen scheduling and space management.

It is emphasized that all five of the planning directions outlined in this report are highly **interdependent** and potential changes to current policies, processes and tools must be considered from an integrated planning perspective. Each planning direction complements efforts across the institution to effectively and efficiently manage the mission-critical academic scheduling process.

This appendix is organized as follows:

A. Investigate Scheduling Authority Model Options	E-2
B. Review Scheduling Policies, Practices, Timelines and Staffing Levels	E-4
C. Review Options to Increase Flexibility within the Standard Time Grid	E-7
D. Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements	E-21
E. Research Scheduling Software Systems	E-23

Additional Information on Planning Directions

Planning Direction A	Investigate Scheduling Authority Model Options
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Review the merits of different scheduling models that can reduce the constraints on scheduling authority that are currently hindering efficient and effective scheduling. Models / strategies for investigation can include, for example: <ul style="list-style-type: none"> <u>Fully decentralized</u> - Colleges / Schools assigned local control over the full inventory of teaching space required to deliver their programs and activities based on verified analysis of need <u>Shared decentralized</u> - Colleges / Schools have priority use of certain teaching spaces with mechanisms/tools in place that allow use by other academic units once priority college / school needs have been met <u>Status quo adjusted</u> – Colleges / Schools retain local control of teaching labs and low capacity classrooms while RO controls scheduling of large classrooms and lecture halls. For the latter spaces, key change is that Departments provide the RO with detailed information on course delivery attributes - pattern of delivery, learning environment typology, section size, etc. instead of exact time of delivery, specific room number, etc. University's new course scheduling software generates schedules that achieve Department goals for delivery and balance competing demands for high capacity classroom space. <u>Fully centralized</u> - All teaching space is scheduled centrally with new scheduling software enabling Departments to achieve desired delivery goals through specification of a full range of delivery attributes

The authority model chosen to manage and oversee the academic scheduling process will need to specify roles, responsibilities and accountabilities for all tasks and decisions associated with the academic scheduling enterprise. It should also outline the expected interdependencies, interchanges, and consultations through which authority will be based. Exercise of the chosen model can best take place following confirmation of updated policies, procedures, standards and objectives for academic scheduling. Institutional dialogue and consensus on these can serve to inform what authority model is most appropriate and how that model will actually be used to manage the academic scheduling process and its component activities.

Given the nature of academic scheduling, it is inevitable that responsibility for different tasks within the process will be distributed across various parties within the institution. This distribution is normally based on which party (or parties) has the knowledge required to effectively carry out each particular task. For some individual tasks or decisions, responsibility may also need to be shared by two or more parties. This being so, there is a pressing need to create trust among participants to enable a perception of fairness among stakeholders. Whatever the model and the matrix of decision making, effective, efficient, respectful and timely communication among participants will be essential.

Additional Information on Planning Directions

Planning Direction A

Investigate Scheduling Authority Model Options

As stated, authority/decision-making models must clearly specify who is responsible for what tasks and decisions as well as the expectations of how tasks or decisions will be handled. Stakeholder engagement based on transparent communication is crucial. Arrangements for the resolution of conflict are of particular importance. While the goal will of course be to minimize conflict, it is important to know the process to be used for various conflicts, who will be responsible for decisions, and the basis on which such decisions are expected to be made. In many instances, decision makers will be individuals or work units.

In other cases, the decision may be made by a representative committee or other similar group. Such mechanisms complement the normal authority channels and can be used to identify potentially desirable changes to policies or procedures.

Table B reflects several options for authority/decision-making models based on key tasks and decisions to be taken. Institutional discussions and decisions on updated policies, procedures and standards can accompany discussion of what model would serve the institution best, enabling an optimal choice.

Table B: Comparison of Scheduling Authority Model

	Fully Centralized	Hybrid	Fully Decentralized
Determination of Courses and Sections to Offer	Academic unit	Academic unit	Academic unit
Determination of Room Requirements (Room Type)	Academic unit	Academic unit	Academic unit
Determination of Room Size	Central unit	Various options for sharing to be determined (E.g. Guidance from Course Demand Work Group)	Academic unit
Determination of Room Location	Central unit	Central unit	Central unit for most
Course Delivery Pattern	Academic unit	Academic unit	Academic unit
Identification of Potential Instructor Availability Constraints (including Adjunct Faculty)	Academic unit	Academic unit	Academic unit
Response to Instructor Availability Constraints (including Adjunct Faculty) The school may chose to create different rules for full-time and part-time instructors	Central unit	Various options for sharing to be determined (E.g. Committee)	Academic unit
Determination of Course Meeting Times	Central unit	Various options for sharing (E.g. Large = central; Small/labs = academic)	Academic unit

Additional Information on Planning Directions

Planning Direction B	Review Scheduling Policies, Processes, Timelines and Staffing Levels
Areas for Exploration by UMBC	<ul style="list-style-type: none"> • Revise/ expand UMBC scheduling policies. Consider addressing, for example: <ul style="list-style-type: none"> · Scheduling mission statement, quality objectives for student schedules and faculty schedules · Standard time patterns · Policies around scheduling priorities and allowable constraints · Guidelines for scheduling of events and ad hoc activities · Guidelines on instructional space management, roles and responsibilities, etc. · Instructional space utilization targets · Other • Revise scheduling processes, as appropriate to: <ul style="list-style-type: none"> · Address changes stemming from work on Planning Directions A-D · Address issues identified during Study (Sections 3 and 4) and through other means. • Review scheduling timelines collaboratively with academic stakeholders to optimize scheduling task durations and deadlines, meet registration targets for students, and minimize changes after student schedules are published. • Review staffing levels to ensure adequate resources are in place to support the vital scheduling enterprise. • Consider developing mechanisms to collect information on scheduling quality outcomes, student and faculty priorities to inform scheduling planning and practices.

Policy, Processes and Timelines

Policy, process, timelines and staffing for academic scheduling are inextricably tied. The other four planning directions presented in this report reflect this interdependency and can serve as components of the broader review of policies, processes, timelines and staffing called for here. Of course, a broad review of academic scheduling offers the possibility of potentially significant change for UMBC and community stakeholders. Institutional consensus on change will need to be built before effective action can be taken. Development of consensus will require: leadership commitment, guidance and support; comprehensive and reliable data; engaged stakeholder participation; strong and transparent communication; a realistic time frame; and a process which can enjoy the confidence of the community. It is suggested that UMBC establish a representative body to oversee and be accountable for review activities as outlined above.

A first and crucial review step is discussion and confirmation of institution objectives and priorities for changes in academic scheduling. What are the challenges to address? What are the opportunities to be exploited? Are there aspects of the current process which could be significantly enhanced by a change in timelines? If so what might be other ramifications? Based on discussions to date, it appears that elimination or dramatic reduction in the number of unplaced course sections would be an expected objective. Another possible objective might be that any room requirements for course delivery specified by an academic unit would be guaranteed to be provided in any room assigned.

Planning Direction B

Review Scheduling Policies, Processes, Timelines and Staffing Levels

A central issue will be determining how much priority should be attached to optimization of room and seat utilization and what steps are deemed reasonable to support this optimization.

The comprehensiveness and degree of proscription in policies for course scheduling vary considerably from institution to institution. In essence, colleges and universities create policy (and pursuant procedures) to support the approach to scheduling management which is judged to fit the institution and its requirements best. Selected samples of policies (some accompanied by procedures) are provided in the links on the following page. These reflect a range of approaches to management of the academic scheduling process.

Any changes in scheduling policies and procedures must provide confidence to academic units that core requirements for high quality course delivery will be met and that special local issues will be considered if not fully addressed as hoped for by the academic unit. Changes proposed must also be realistic in terms of expectations of central and local participants in the academic scheduling process. This will require careful planning in terms of timelines, required tools and resources, staffing training and communications.

Staffing

The number of staff dedicated to scheduling activities in central and local academic units will vary depending on the approach to scheduling management adopted. It is common, however, for academic staff with scheduling duties to combine these duties with support for other academic activities. While titles of individuals who participate in scheduling on behalf of academic units may vary, they will consistently have extensive knowledge of the scheduling needs and preferences of the academic unit and those issues which may be of special significance. In some institutions, academic units will dedicate both an administrative support person and an academic to scheduling activities. Ideally such individuals will participate in the scheduling process over an extended period, passing on their knowledge and expertise when new academic players come on board.

Central staff involved with scheduling are more typically focused exclusively on the scheduling process. In mid-sized colleges and universities, it is common to have 3 to 6 staff, or more in a central scheduling unit. This number will be determined by how tasks are shared between the central and local academic units (particularly system data entry); whether or not scheduling software is in use; and the extent to which the software is used (e.g. will the software determine section meeting times or simply the room to be assigned?). In most central scheduling units there will be a Scheduling Manager responsible for the unit who reports to a Registrar, Associate Registrar or other central administrative officer. The manager will have 3-5 staff responsible for central scheduling support and software activities. Often titled Scheduling Officers or Scheduling Assistants, these staff are frequently assigned to provide scheduling support for a specific area (or areas) within the institution (e.g. Scheduling Officers assigned by Faculty). Again, continuity of assignments over time facilitates development of strong and effective connections between the central and local academic units. In some larger units there may also be a Scheduling Officer dedicated to specific activities, most often software support and management.

Additional Information on Planning Directions

Planning Direction B	Review Scheduling Policies, Processes, Timelines and Staffing Levels
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Sample Institutional Scheduling Policies

University	Scheduling Policy Website
Auburn University	https://sites.auburn.edu/admin/universitypolicies/Policies/AuburnUniversityClassroomSchedulingPolicy.pdf
Brown University	https://www.brown.edu/about/administration/registrar/university-scheduling-office/scheduling-policies-and-considerations
Simon Fraser University	https://www.sfu.ca/policies/gazette/teaching/t30-01.html
University of Illinois	https://registrar.illinois.edu/faculty-staff/policies/course-scheduling-policies/
University of Michigan	http://provost.umich.edu/space/instruct/ClassClassroomSchedulingPolicy.pdf

Additional Information on Planning Directions

Planning Direction C	Review Options to Enhance Flexibility within the Standard Time Grid
Areas for Exploration by UMBC	<ul style="list-style-type: none"> • Research standard time models in use at peer universities • Understand priorities of the UMBC academic community for patterns of course delivery that optimize learning and student success • Understand student preferences for patterns of course delivery and quality schedules • Revisit overall efficacy of free hour plan • Consider ways the weekly scheduling grid can be structured to accommodate standard times. E.g. An hourly scheduling grid can support 1, 2 or 3 period delivery patterns at any time of day

Standard times for course meetings and associated slot systems are common practice in post-secondary academic scheduling. Such arrangements are designed to achieve two mission-critical outcomes for the institution:

1. to enable course delivery in a manner which ensures a quality student learning experience
2. to optimize room usage across the “schedulable hours of the week” to maximize use of finite institution space and teaching resources

At most institutions, the course delivery model for 3 credit courses specifies 150 student contact minutes per week. This total can be achieved by one 150-minute meeting, two 75-minute meetings or three 50-minute meetings. Arrangements for 4 credit courses or other special courses (e.g. Language) are adjusted accordingly.

There are a wide range of standard time/slot approaches in play at North American colleges and universities. Many associate slot length with specific days of the week (e.g. 50-minute sessions on MWF and 75-minute sessions on TTh). In such cases, there are no 75-minute course deliveries on Mondays, Wednesdays or Fridays. At other institutions, 50, 75 and 150-minute slots may be in use across all days of the week and potentially throughout all times of the day. This approach heightens flexibility and potentially increases utilization but also increases the need to ensure that course deliveries on a given day do not conflict for students. Automated scheduling software is a key tool in taking advantage of such opportunities (see Planning Direction A).

Another consideration regarding standard times is whether or not a course meeting must occur at the same time of day on the different days of delivery. Must three 50-minute deliveries all occur at the same time on three different days or is there potential for using different times of day? If different meeting times during the week are possible, automated scheduling software can serve to support this type of flexibility while increasing optimization of resources.

An alternative to standard times and associated slots is a system where only the number and length of weekly course meetings are specified (often with some requirement for elapsed times between meetings). Any room requirements for optimal course delivery are also expected to be observed. This approach ensures that preferred course delivery is achieved to support optimal learning outcomes while relying on automated scheduling software to confirm times and locations that optimize resource use. While a move to such an approach can provide significant benefits, transition is challenging and requires appropriate tools and change management strategies.

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

In planning future directions, it suggested that, at a minimum, UMBC evaluate a revised approach on standard times and slots where slots of differing lengths are used across each day of the week (such as those used in the exemplars shown on the following pages). These discussions should also review the possibility of increasing the availability of 150-minute slots throughout the day.

In reviewing an alternative strategy for standard times and slots, consideration might also be given to excluding some Friday times in the schedulable hours used to establish slots. A number of institutions do not schedule courses after 1 or 2 pm on Fridays. Friday afternoons could be expected to be used for in-term tests which cannot be held in the usual class setting or for other course activities or meetings.

It is also suggested that UMBC review the benefits and challenges of the current Free Hour. It is unusual, in the experience of the Consultant, for three prime hour time slots to be excluded from the weekly scheduling window. The addition of three peak time teaching hours could significantly reduce the number of unplaced courses even if other changes were not made. One example of an alternate model is to maintain a single institution-wide free hour in combination with college/school level free hours at different times.

Sample Standard Time Models in Use at Peer Universities

To support the review and discussion of alternate models, four sample standard time grids found at peer institutions are illustrated on pages E-11 to E-20. The samples differ from the traditional 50-minute MWF and 75-minute TTh model currently in use at UMBC in that they offer a higher degree of flexibility for the delivery of periods of different lengths through days of the week and times of the day.

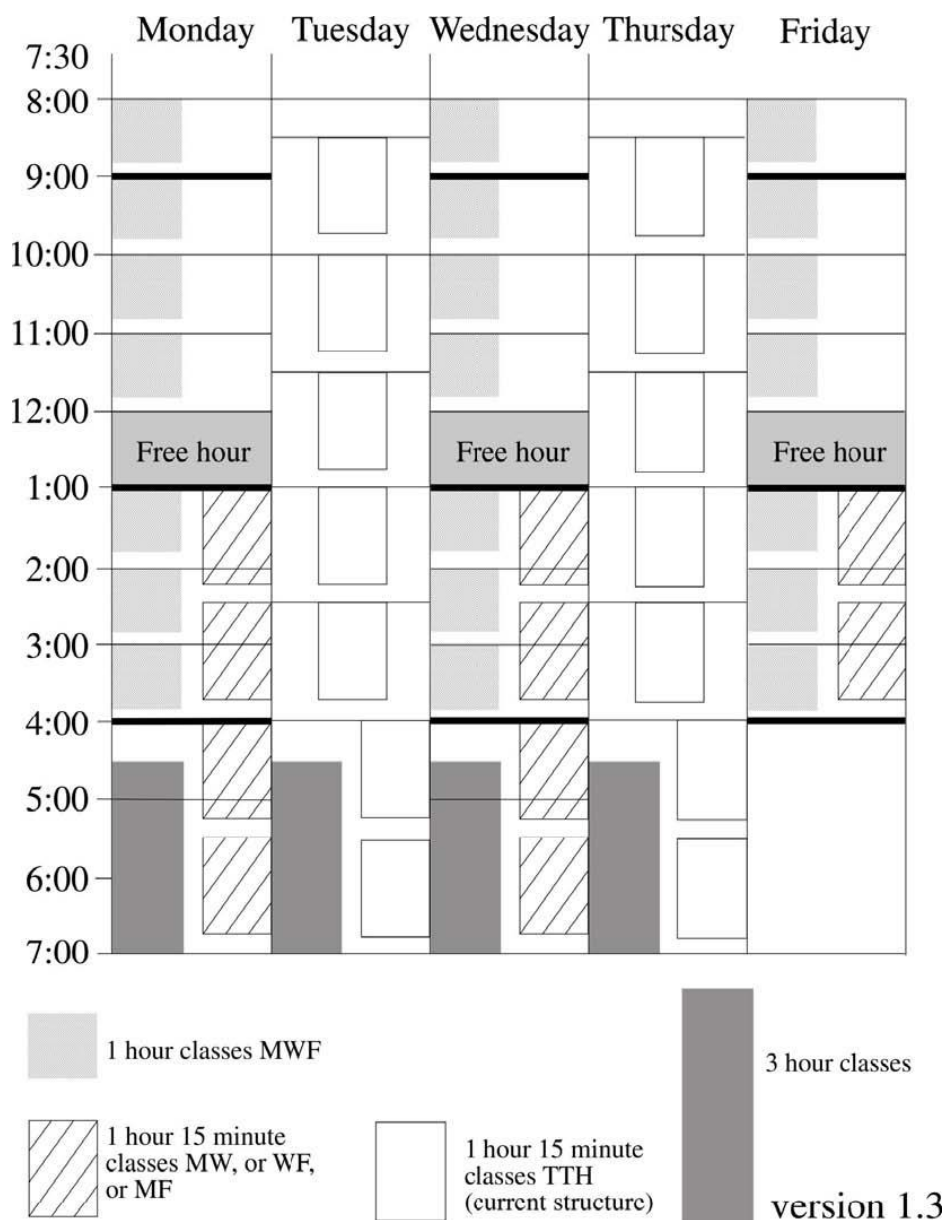
The four samples differ from one another in the details of the allowable patterns illustrating that there are many ways to structure a flexible scheduling grid. Note that none of the sample grids designate cross-institution free hours.

To facilitate comparison, the current standard time structure at UMBC is shown on pages E-9 to E-10.

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

UMBC - Current Standard Time Plan



Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

UMBC Current Standard Time Plan

SCHEDULING GUIDELINES (Effective Fall 2005)**Standard Time Blocks for 3-Credit Classes**

MWF	8:00 – 8:50 AM	TuTh	8:30 – 9:45 AM
MWF	9:00 – 9:50 AM	TuTh	10:00 – 11:15 AM
MWF	10:00 – 10:50 AM	TuTh	11:30 AM – 12:45 PM
MWF	11:00 – 11:50 AM	TuTh	1:00 - 2:15 PM
MWF	1:00 – 1:50 PM	TuTh	2:30 – 3:45 PM
MWF	2:00 – 2:50 PM	TuTh	4:00 – 5:15 PM
MWF	3:00 – 3:50 PM	TuTh	5:30 – 6:45 PM
		TuTh	7:10 – 8:25 PM
MWF*	1:00 – 2:15 PM	Tu	4:30 – 7:00 PM
MWF*	2:30 – 3:45 PM	Tu	7:10 – 9:40 PM
MWF*	4:00 – 5:15 PM	Th	4:30 – 7:00 PM
MW	5:30 – 6:45 PM	Th	7:10 – 9:40 PM
MW	7:10 – 8:25 PM		
M	4:30 – 7:00 PM		
M	7:10 – 9:40 PM		
W	4:30 – 7:00 PM		
W	7:10 – 9:40 PM		

* MW, or WF, or MF

Distribution of Class Meeting Times

Departments should adhere to the following scheduling guidelines for all departments (with percentages based on all classes which have a defined on-campus meeting location):

- Class meetings should be evenly balanced (within 5%) between MWF (including M, W, F, MW, MF & WF) and T TH (including T, TH) scheduling. Departments are encouraged to establish workload policies which facilitate this balance.
- 15-20% of a department's classes should either: a) start before 10 AM with 5-10% starting before 9 AM or b) start at or after 7:10 PM.
- Departments may schedule up to 5% of their classes (by pairing them) in the MW 1-2:15 PM and 2:30-3:45 PM time slots.

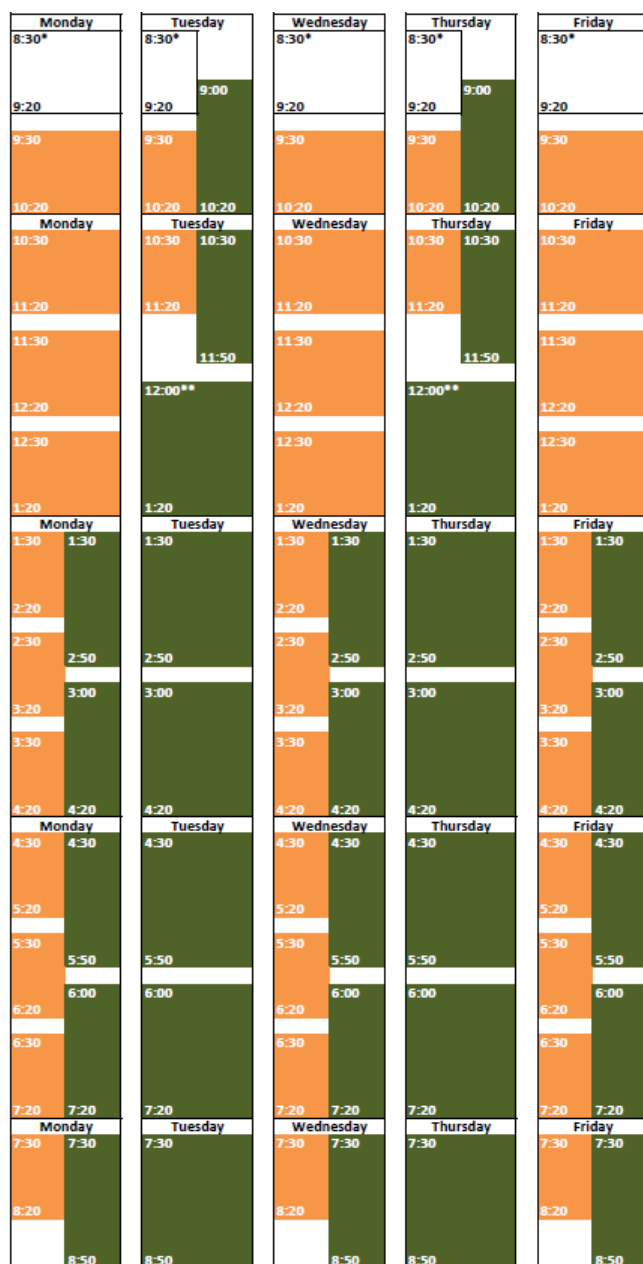
Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 1 - Stanford University

Key Features

- Designed to accommodate 50 and 80-minute meetings. 150-minute meetings not standard but can be achieved by combining 2 consecutive 80-minute times or 3 consecutive 50-minute times
- Unlike traditional model (i.e. 50-minute meetings only on MWF; 80-minute meetings only on TTh), this model offers options for scheduling 80-minute meetings on MWF afternoons and 50-minute periods on TTh morning over and above the traditional MWF

**Blocks**

The calendar has been broken into 50 (orange) and 80 (green) minute blocks. 10 minutes has been left between classes for travel time.

To reduce conflicts, all classes start at a standard time as represented on the grid. Classes may end early (e.g., a 75-minute class) but they cannot start early or late.

Blocks may be combined to create lengthier classes, typically 2- or 3-hour classes, provided that the standard start time is maintained.

Start Times

Most classes start on the half hour, except as necessary for the TTh 80 minute patterns and the MWF afternoon 80-minute pattern.

Mornings

Generally, 50 minute blocks on MWF and 80 minute blocks on TTh, except for 50 minute blocks on TTh to accommodate five-day foreign language classes and labs.

*The 8:30 block MTWTF is typically available for five-day foreign language classes, and labs and discussions where students have other options for enrollment.

Afternoons

50 minute blocks on MWF and 80 minute blocks on MTWThF.

**The 80 minute block on TTh beginning at 12:00 may be extended to a 2-hour block starting at 11:30.

Source and more information: <https://registrar.stanford.edu/staff/courses-class-scheduling/meeting-patterns-departmental-administrators/class-meeting-pattern>

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 1 - Stanford University (continued)

Start Times

The following table shows allowable start times for different day patterns.

In order to minimize class conflicts for students, all classes must start at a standard time.

- A class which meets only one day may pick any allowable block.
- Blocks may be combined, and classes may end early; but no class can start earlier or later than one of the standard starting times.
- A 75-minute class is equivalent to an 80-minute class.

MWF - MW - WF - MF (50 mins)	MW - WF - MF - MWF (80 mins)	MTWTh - MTWThF - TTh (50 mins)	TTh (80 mins)
8:30		8:30	
9:30		9:30	9:00
10:30		10:30	10:30
11:30			
12:30			12:00
1:30	1:30		1:30
2:30	3:00		3:00
3:30			
4:30	4:30		4:30
5:30	6:00		6:00
6:30			
7:30	7:30		7:30

Additional Information on Planning Directions

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 1 - Stanford University (continued)

Class Meeting Patterns Summary

Begin Time	End Time	Days of the Week	Duration
8:30 AM	9:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
8:30 AM	10:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
8:30 AM	11:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
9:00 AM	10:20 AM	TTh, Single Days (T,Th)	80
9:00 AM	11:50 AM	TTh, Single Days (T,Th)	170
9:30 AM	10:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
9:30 AM	11:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
9:30 AM	12:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	170
10:30 AM	11:20 AM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
10:30 AM	11:50 AM	TTh, Single Days (T,Th)	80
10:30 AM	12:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	110
10:30 AM	1:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
11:30 AM	12:20 PM	MTWThF, MTWTh, MWF, WF, MF, MW, Single Days (M,W,F)	50
11:30 AM	1:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
11:30 AM	2:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	170
12:00 PM	1:20 PM	TTh, Single Days (T,Th)	80
12:00 PM	2:50 PM	TTh, Single Days (T,Th)	170
12:30 PM	1:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	50
12:30 PM	2:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	110
12:30 PM	3:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	170
1:30 PM	2:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	50
1:30 PM	2:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	80
1:30 PM	3:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	110
1:30 PM	4:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
2:30 PM	3:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	50
2:30 PM	4:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	110
2:30 PM	5:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	170
3:00 PM	4:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	80
3:00 PM	5:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
3:30 PM	4:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	50
3:30 PM	5:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	110
3:30 PM	6:20 PM	MWF, WF, MF, MW, Single Days (M,W,F)	170
4:30 PM	5:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
4:30 PM	5:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	80
4:30 PM	6:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
4:30 PM	7:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
5:30 PM	6:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
5:30 PM	7:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
6:00 PM	7:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	80
6:00 PM	7:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
6:00 PM	8:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170
6:30 PM	7:20 PM	MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
6:30 PM	8:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
7:30 PM	8:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	50
7:30 PM	8:50 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	80
7:30 PM	9:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	110
7:30 PM	10:20 PM	MTWThF, MTWTh, MWF, TTh, WF, MF, MW, Single Days (M,T,W,Th,F)	170

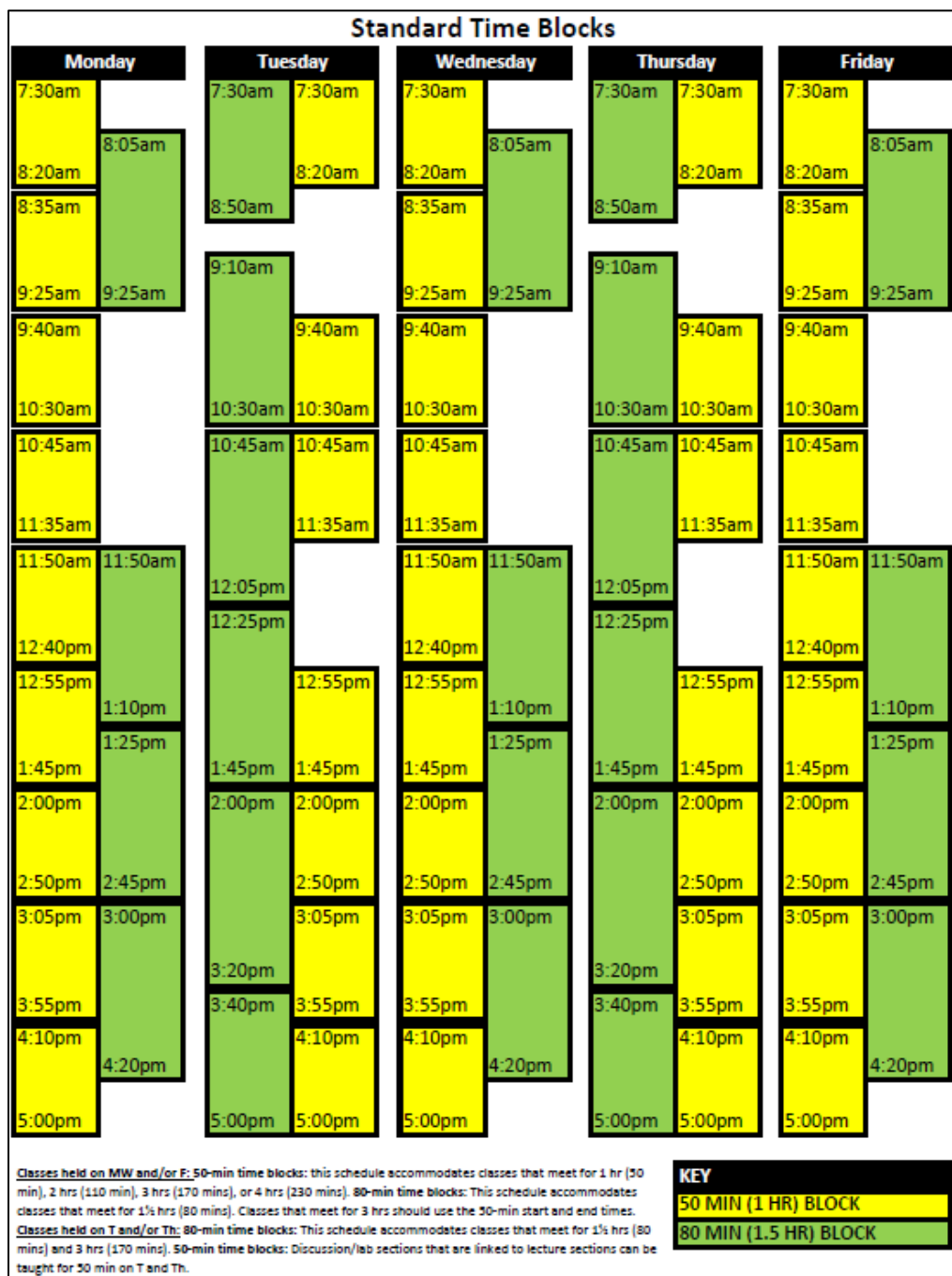
Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 2 – University of Utah

Key Features

- Accommodates 50 and 80-minute meeting times all five days per week
- 150-minute meetings not standard, normally accommodated by consecutive 80-minute meetings



Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 2 – University of Utah (continued)

Please note that classes should both start and end at the standard times.

1. Classes held on Mondays, Wednesdays, and/or Fridays

50-minute time blocks

This schedule accommodates classes that meet for 1 hour (50 minutes), 2 hours (110 minutes), 3 hours (170 minutes), or 4 hours (230 minutes).

Starting Times	7:30 am	8:35 am	9:40 am	10:45 am	11:50 am	12:55 pm	2:00 pm	3:05 pm	4:10 pm
Ending Times	8:20 am	9:25 am	10:30 am	11:35 am	12:40 pm	1:45 pm	2:50 pm	3:55 pm	5:00 pm

80-minute time blocks

This schedule accommodates classes that meet for 1½ hours (80 minutes). Classes that meet for 3 hours should use the 50-minute start and end times.

Starting Times	8:05 am	11:50 am	1:25 pm	3:00 pm
Ending Times	9:25 am	1:10 pm	2:45 pm	4:20 pm

2. Classes held on Tuesdays and/or Thursdays

80-minute time blocks

This schedule accommodates classes that meet for 1½ hours (80 minutes), and 3 hours (170 minutes).

Starting Times	7:30 am	9:10 am	10:45 am	12:25 pm	2:00 pm	3:40 pm
Ending Times	8:50 am	10:30 am	12:05 pm	1:45 pm	3:20 pm	5:00 pm

3. Discussions/labs taught for 50-minutes

Discussion/lab sections that are linked to lecture sections can be taught for 50 minutes on Tuesdays and Thursdays at the following times:

Starting Times	7:30 am	9:40 am	10:45 am	12:55 pm	2:00 pm	3:05 pm	4:10 pm
Ending Times	8:20 am	10:30 am	11:35 am	1:45 pm	2:50 pm	3:55 pm	5:00 pm

**Please note that other 50 minute time blocks should not be used as it would overlap with Tuesday and Thursday 80 minute blocks in prime time.

4. Four or five day a week classes

Classes that currently meet 4 or 5 days a week should adhere to the starting and ending times for Mondays, Wednesdays, and Fridays. In order to reduce the overlap of class times on Tuesdays and Thursdays, departments are encouraged to limit the number of 4 or 5 day a week classes that meet at 8:35 am – 9:25 am and 11:50 am – 12:40 pm.

5. Standardized evening start times are as follows:

4:35 pm	6:00 pm	7:15 pm
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Note: Graduate level courses that are not combined with undergraduate courses and are taught in department space are not required to adhere to standardized times.

Source and additional information: <https://registrar.utah.edu/scheduling/classes/times.php>

Additional Information on Planning Directions

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 3 – University of Notre Dame

Key Features

- Accommodates meetings of 50-minutes, 75-minutes and longer (90 - 165 minutes). Options for all five days per week

New Standard 50-Minute and 75-Minute - effective Spring 2014 term						
Meeting Times for use of General Purpose rooms*						
MONDAY		TUESDAY	WEDNESDAY		THURSDAY	FRIDAY
50Min	75Min	75Min	50Min	75Min	75Min	50Min
MWF 8:20-9:10	MW 8:00-9:15	Dept Exam Time Slot- no UG Classes	MWF 8:20-9:10	MW 8:00-9:15	Dept Exam Time Slot- no UG Classes	MWF or F-only 8:20-9:10
MWF 9:25-10:15	MW 9:30-10:45	TR 9:30-10:45	MWF 9:25-10:15	MW 9:30-10:45	TR 9:30-10:45	MWF or F-only 9:25-10:15
MWF 10:30-11:20	MW 11:00-12:15	TR 11:00-12:15	MWF 10:30-11:20	MW 11:00-12:15	TR 11:00-12:15	MWF or F-only 10:30-11:20
MWF 11:30-12:20	MW 12:30-1:45	TR 12:30-1:45	MWF 11:30-12:20	MW 12:30-1:45	TR 12:30-1:45	MWF or F-only 11:30-12:25
MWF 12:50-1:40	MW 2:00-3:15	TR 2:00-3:15	MWF 12:50-1:40	MW 2:00-3:15	TR 2:00-3:15	MWF or F-only 12:50-1:40
MWF 2:00-2:50	MW 3:30-4:45	TR 3:30-4:45	MWF 2:00-2:50	MW 3:30-4:45	TR 3:30-4:45	MWF or F-only 2:00-2:50
MWF 3:30-4:20	MW 5:05-6:20	TR 5:05-6:20	MWF 3:30-4:20	MW 5:05-6:20	TR 5:05-6:20	MWF or F-only 3:30-4:20
MWF 5:05-5:55			MWF 5:05-5:55			MWF or F-only 5:05-5:55

Policies for use of General Purpose rooms effective Fall 2013:

- 1) Full time slot must be used to qualify as a standard meeting pattern.
- 2) Only courses with a standard meeting time may use General Purpose rooms during the prime-time hours of 9:00-3:00. Exceptions will be granted by the Office of the Provost on a case-by-case basis.
- 3) Although non-standard times may be used outside of prime-time hours, standard class times are provided and recommended.

Timetable provided by the Office of the Registrar.
Available online at <http://registrar.nd.edu>

Additional Information on Planning Directions

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 3 – University of Notre Dame (continued)

Standard Meeting Times for use of General Purpose rooms (prime time meeting patterns highlighted in BOLD)			
50-Min Time slots		75-Min Time slots	
MWF	8:20-9:10	MW	8:00-9:15
MWF	9:25-10:15	MW	9:30-10:45
MWF	10:30-11:20	MW	11:00-12:15
MWF	11:30-12:20	MW	12:30-1:45
MWF	12:50-1:40	MW	2:00-3:15
MWF	2:00-2:50	MW	3:30-4:45
MWF	3:30-4:20	MW	5:05-6:20
MWF	5:05-5:55		
Tue (only)	9:30-10:20	TR	9:30-10:45
Tue (only)	11:00-11:50	TR	11:00-12:15
Tue (only)	12:30-1:20	TR	12:30-1:45
Tue (only)	2:00-2:50	TR	2:00-3:15
Tue (only)	3:30-4:20	TR	3:30-4:45
Tue (only)	5:05-5:55	TR	5:05-6:20
Thu (only)	9:30-10:20	Tue (only)	9:30-10:45
Thu (only)	11:00-11:50	Tue (only)	11:00-12:15
Thu (only)	12:30-1:20	Tue (only)	12:30-1:45
Thu (only)	2:00-2:50	Tue (only)	2:00-3:15
Thu (only)	3:30-4:20	Tue (only)	3:30-4:45
Thu (only)	5:05-5:55	Tue (only)	5:05-6:20
Fri (only)	8:20-9:10	Thu (only)	9:30-10:45
Fri (only)	9:25-10:15	Thu (only)	11:00-12:15
Fri (only)	10:30-11:20	Thu (only)	12:30-1:45
Fri (only)	11:30-12:20	Thu (only)	2:00-3:15
Fri (only)	12:50-1:40	Thu (only)	3:30-4:45
Fri (only)	2:00-2:50	Thu (only)	5:05-6:20
Fri (only)	3:30-4:20		
Fri (only)	5:05-5:55		

One-day a week meeting patterns for upper-level courses:		
Mondays (only)	8:20-9:50	90-min
Mondays (only)	8:20-10:15	115-min
Mondays (only)	8:00-10:45	165-min
Mondays (only)	10:30-12:25	115-min
Mondays (only)	12:30-3:15	165-min
Mondays (only)	2:00-3:55	115-min
Mondays (only)	3:30-5:00	90-min
Mondays (only)	3:30-6:15	165-min
Tuesdays (only)	8:20-9:50	90-min
Tuesdays (only)	8:20-10:15	115-min
Tuesdays (only)	8:00-10:45	165-min
Tuesdays (only)	12:30-3:15	165-min
Tuesdays (only)	2:00-3:55	115-min
Tuesdays (only)	3:30-5:00	90-min
Tuesdays (only)	3:30-6:15	165-min
Wednesdays (only)	8:20-9:50	90-min
Wednesdays (only)	8:20-10:15	115-min
Wednesdays (only)	8:00-10:45	165-min
Wednesdays (only)	10:30-12:25	115-min
Wednesdays (only)	12:30-3:15	165-min
Wednesdays (only)	2:00-3:55	115-min
Wednesdays (only)	3:30-5:00	90-min
Wednesdays (only)	3:30-6:15	165-min
Thursdays (only)	8:20-9:50	90-min
Thursdays (only)	8:20-10:15	115-min
Thursdays (only)	8:00-10:45	165-min
Thursdays (only)	12:30-3:15	165-min
Thursdays (only)	2:00-3:55	115-min
Thursdays (only)	3:30-5:00	90-min
Thursdays (only)	3:30-6:15	165-min
Friday (only)	8:20-9:50	90-min
Friday (only)	8:20-10:15	115-min
Friday (only)	8:00-10:45	165-min
Friday (only)	10:30-12:00	90-min
Friday (only)	10:30-12:25	115-min
Friday (only)	12:30-3:15	165-min
Friday (only)	1:20-3:15	115-min
Friday (only)	1:45-3:15	90-min
Friday (only)	2:00-5:00	180-min
Friday (only)	3:30-5:00	90-min
Friday (only)	3:30-5:25	115-min
Friday (only)	3:30-6:15	165-min

Policies for use of General Purpose rooms effective Fall 2013:

- 1) Full time slot must be used to qualify as a standard meeting pattern.
- 2) Only courses with a standard meeting time may use General Purpose rooms during the prime-time hours of 9:00-3:00. Exceptions will be granted by the Office of the Provost on a case-by-case basis.
- 3) Although non-standard times may be used outside of prime-time hours, standard class times are provided and recommended.

Source and more information: <https://registrar.nd.edu/students/standardtimes.php>

Additional Information on Planning Directions


Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 4 – University of Iowa

Key Features

- Provides diverse options for both 3 x 50-minute and 2 x 75-minute deliveries

 APPROVED CLASS MEETING TIME MODEL Office of the Registrar, Classroom Scheduling University Classrooms Class Time Sequencing									
Column	1	2	3	4	5	6	7		
	MWF 50 minute classes: 1, 2 or 3 days/week Includes MW or WF	TR 75 minute classes: 1 or 2 days/week	MW 75 minute classes	WF 75 minute classes	TR 50 minute classes: 1 or 2 days/week	3 Day Non MWF* 50 minute classes: *Includes MTW, TWR	4 or 5 Days/Week 50 minute classes		
7:00	10 minute pass interval	15 minute pass interval			Note: Mixed pass interval occurs in some instances		10 minute pass interval		7:00
:15									:15
:30	7:30 - 8:20 am				7:30 - 8:20 am	7:30 - 8:20 am	7:30 - 8:20 am		:30
:45	Timeslot not enforced used at departmental request	8:00 - 9:15 am	8:00 - 9:15 am	8:00 - 9:15 am	Timeslot not enforced used at departmental request	Timeslot not enforced used at departmental request	Timeslot not enforced used at departmental request		:45
8:00									8:00
:15									:15
:30	8:30 - 9:20 am				8:30 - 9:20 am	8:30 - 9:20 am	8:30 - 9:20 am		:30
:45									:45
9:00									9:00
:15									:15
:30	9:30 - 10:20 am	9:30 - 10:45 am			9:30 - 10:20 am	9:30 - 10:20 am	9:30 - 10:20 am		:30
:45									:45
10:00									10:00
:15									:15
:30	10:30 - 11:20 am				11:00 - 11:50 am	10:30 - 11:20 am	10:30 - 11:20 am		:30
:45		11:00 am - 12:15 pm							:45
11:00									11:00
:15									:15
:30	11:30 am - 12:20 pm					11:30 am - 12:20 pm	11:30 am - 12:20 pm		:30
:45									:45
12:00									12:00
:15									:15
:30	12:30 - 1:20 pm	12:30 - 1:45 pm		12:30 - 1:45 pm WF ONLY Must utilize Monday with this option	12:30 - 1:20 pm	12:30 - 1:20 pm	12:30 - 1:20 pm		:30
:45									:45
1:00									1:00
:15									:15
:30	1:30 - 2:20 pm			2:00 - 3:15 pm WF ONLY Must utilize Monday with this option	2:00 - 2:50 pm	1:30 - 2:20 pm	1:30 - 2:20 pm		:30
:45		2:00 - 3:15 pm							:45
2:00									2:00
:15									:15
:30	2:30 - 3:20 pm					2:30 - 3:20 pm	2:30 - 3:20 pm		:30
:45									:45
3:00									3:00
:15									:15
:30	3:30 - 4:20 pm	3:30 - 4:45 pm	3:30 - 4:45 pm		3:30 - 4:20 pm	3:30 - 4:20 pm	3:30 - 4:20 pm		:30
:45									:45
4:00									4:00
:15									:15
:30	4:30 - 5:20 pm					4:30 - 5:20 pm	4:30 - 5:20 pm		:30
:45									:45
5:00									5:00
:15									:15
:30	5:30 - 6:20 pm					5:30 - 6:20 pm	5:30 - 6:20 pm		:30
:45									:45
6:00									6:00
:15									:15
:30	6:30 - 7:20 pm	6:30 - 7:20 pm	6:30 - 7:20 pm	6:30 - 7:20 pm	6:30 - 7:20 pm	6:30 - 7:20 pm	6:30 - 7:20 pm		:30
:45									:45
7:00									7:00
:15									:15
:30	7:30 - 8:20 pm	7:30 - 8:20 pm	7:30 - 8:20 pm	7:30 - 8:20 pm	7:30 - 8:20 pm	7:30 - 8:20 pm	7:30 - 8:20 pm		:30
:45									:45
8:00									8:00
:15									:15
:30	8:30 - 9:20 pm	8:30 - 9:20 pm	8:30 - 9:20 pm	8:30 - 9:20 pm	8:30 - 9:20 pm	8:30 - 9:20 pm	8:30 - 9:20 pm		:30
:45									:45
9:00									9:00
:15									:15
:30									:30
:45									:45
10:00									10:00
:15									:15
	Midterm Examination Slots: 6:30-8:30 pm or 8:30-8:00 pm & 8:45 - 10:15 pm								
	Version 5/25/14								

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 4 – University of Iowa (continued)

[Home](#) » [Faculty & Staff](#) » [Classroom Scheduling](#)**Fall and Spring- Policies and Procedures****Classroom Utilization in Departmental Controlled Spaces**

All departments are expected to utilize their own classrooms 30 hours per week for scheduled instruction BEFORE requesting the use of university classroom space. Classroom utilization statistics will be reported to the Provost Office. Underutilization of classroom space may lead to a reversion of that space to Classroom Scheduling.

Although the standardized time frames are a requirement in university classrooms only, should a departmental course need to be relocated from private controlled space to a university classroom, a change in class time might be required in order to secure teaching space within the university classroom inventory pool.

University Classroom (UCR) Scheduling Policies and Regulations

The primary goal of the Office of the Registrar is to maximize courses, staff, and teaching spaces while reducing operating costs to be fiscally efficient and environmentally responsible. This focus is especially imperative in these fiscally challenged years ahead. Following standard set scheduling patterns with compatible start and ending times, the overall schedule fits together with less conflict in a consistent and equitable manner. In order to achieve these goals, revised scheduling policies and procedures have been established by Classroom Scheduling and approved by the Office of the Provost. The scheduling regulations apply to those colleges who utilize university classrooms from the Colleges of Liberal Arts and Sciences, Education, and Engineering, and Tippie College of Business. Use of scheduling regulations permits efficient exercise of available classroom space as well as provide an orderly framework for instructional planning to reduce course concentration. Use of standard time blocks also allow students greater flexibility and opportunity in scheduling classes offered by different departments or colleges.

University classrooms (UCR) are scheduled on a 50-hour week. UCR are scheduled by use of standardized class hours, Monday–Friday, which incorporate both daytime and evening class hours. Standardized class hours begin at 8:30 a.m. on MWF and 8:00 a.m. on TTh. Evening class hours typically begin at 6:30 p.m. M, T, W, or Th evenings. Departments are required to distribute their courses in a variety of meeting patterns (MWF vs. TTh) throughout the full academic day, avoiding concentration during the peak hours of 9:00 a.m.–4:30 p.m.

Planning Direction C

Review Options to Enhance Flexibility
within the Standard Time Grid

Sample 4 – University of Iowa (continued)

Campus Benefits to Approved Class Meeting Times:

- Standardized evening class times reduces class scheduling overlaps and in number of classroom facilities required allowing for reduced energy consumption in academic buildings.
- Expands standard class time options for course offerings to maximize registration opportunities for both traditional and non-traditional students in both daytime and evening sessions.
- Raises university classroom utilization efficiencies for continued enrollment increases.
- 7:30 a.m. MWF class time slot was identified with 10% utilization of the university classroom capacity. Time slot remains available by departmental request.
- 8:30 a.m. MWF becomes NEW official start time across all university classrooms.
- 11 of 15 MWF classroom size categories (14–400) or 73% make greater usage of available classrooms when compared to the old class time structure.
- Additional TTh class time slot (12:30-1:45 p.m.) offers new scheduling option within the coveted “prime time”. As a result, provides opportunities for expanded growth with addition of 221 new class time periods requiring no additional building funds to create classroom space. It is assumed standard TTh 75-minute class times will be used.
- Due to the addition of the new 75-minute 12:30 p.m. TTh time slot, greater classroom usage is possible for the 11:00 a.m.–1:45 p.m. time span.
- TTh class start times will now begin on either the hour or half-hour by increasing TTh class pass times to 15 minutes. In doing so, provides more intuitive class schedules for students and faculty.
- 10 of 15 TTh classroom size categories (14–400) or 67% make greater usage of available classrooms when compared to the old class structure.
- Midterm Evening Examination slots will now offer a 2 hour or a 1 ½ hour testing time slots.

Source and more information: <https://registrar.uiowa.edu/fall-and-spring-policies-and-procedures>

Additional Information on Planning Directions

Planning Direction D	Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements
Areas for Exploration by UMBC	<ul style="list-style-type: none"> • <u>Match instructional room inventory to pedagogies</u> – Develop recurring processes involving academic stakeholders (faculty, students, FDC) to assess ‘ideal’ teaching spaces that support best practice learning delivery and innovative pedagogies. Integrate recommendations into multi-year plans for upgrading of classroom pool. Consider refining definitions already in place to establish a limited number of ‘standard’ classroom types for UMBC detailing key room features and qualities such as furniture type and configuration, technology and equipment. Such standards will help schedulers match room requests to inventory and will allow faculty to know what to expect when given room assignments. Course scheduling software will allow Academics to request specific room typologies during course loading leading to room assignments that better match desired learning delivery modes. • <u>Right-size the instructional room inventory</u> – Develop data-driven analysis tools to assess/predict demand for instructional space. Use this information to drive ongoing assessment and adjustment of classroom inventory to match demand in terms of number of rooms and seat capacity. • <u>Develop mechanisms and/or identify tools to more easily share information</u> on the availability of instructional space among RO, Academic Departments and other stakeholders.

Pedagogy and room capacity are related but distinct factors. They are, however, best dealt with together. Pedagogy is central to the quality of a student’s learning experience. Although inappropriate room size can also have some affect on the quality of the learning experience (e.g. 15 students in a 100-seat lecture theatre), effective matching of course sections to room size is more a matter of optimizing the institution’s room utilization. Of course, one can also argue that optimized room utilization also serves to support a higher quality learning experience. As with the other planning directions presented in this report, improvement of the match of room inventory to pedagogy and course section sizes is a component of the broader review proposed in Planning Direction E. Confirmation of process, participants, leadership and desired outcomes are all essential to achieve optimal results.

A first step in the process is a detailed review of room requirements which are currently specified by academic units and/or their instructors. Itemizing such requirements then provides the ability to create room types which will serve to more easily capture a wide range of possible room requirements. The room inventory can then be broken down to show the number and size of rooms of each room type. The classroom utilization data presented in pages 4-1 to 4-3 of the Utilization report can then be analyzed based on this factor to determine what special bottlenecks may exist for specific room types. This will require the development of data on the number and nature of sections where desired room requirements were both met and not met in recent semesters. This will, in turn, confirm which room types have typically been in shortest supply.

Planning Direction D

Develop Strategies to Better Match Instructional Room Inventory to Pedagogy and Section Size Requirements

Once course sections with unmet room requirements have been identified, consideration can be given to what factors may have created the situation in question. Given current overall classroom utilization data, it is unlikely that the solution required is to build new rooms of specific types. Depending on the breakdown of classroom utilization data by room type, renovation of existing rooms to create more rooms of a certain type may be desirable. Before such measures are taken, however, an analysis of how high demand room types in the current inventory can be better utilized should be undertaken.

Given the centrality of pedagogy in delivery of a quality learning experience, it is proposed that, at an appropriate date in future, observance of specified room requirements become a mandatory outcome in the scheduling process.

Discussions to improve the match of course sections to room size can and should occur simultaneously as part of the review of pedagogical room requirements. Again, a first step is review and analysis of seat utilization data from recent semesters comparing section size to allocated seating capacity. Pages 4-13 to 4-15 of the Utilization Report provides the relevant information showing a high number of course sections where course section size is below or well below established room capacity.

Current results suggest that, to date, optimization of classrooms and seats has not been UMBC's top priority. Depending on the extent of improvement in utilization which is desired, a range of solutions may be possible. The most dramatic solution would be to schedule course sections (including rooms and meeting times) using scheduling software to fully optimize room and seat usage. While this would produce the most dramatic improvement to utilization, the resources required to make such a change may be unrealistic at this time.

A more modest approach would be to identify those course sections which have in recent semesters consistently attracted fewer students than the section size stipulated. Such sections could then be a focus in future semesters. The Scheduling unit could provide data on such courses to Academic units who would be encouraged to reduce initial section sizes based on historical data unless special factors applied (e.g. dramatically increased intake). This approach will work best if opportunity exists to increase section size prior to the end of enrolment should registrations be unexpectedly high.

It is likely that improvements to utilization and the meeting of pedagogical room requirements may also benefit from changes to the current "blackout" period and the current process to address unplaced courses.

Consideration could also be given to what role the Course Demand Work Group might play in improving the match between section and room size.

Planning Direction E	Research Scheduling Software Systems
Areas for Exploration by UMBC	<ul style="list-style-type: none"> Research the attributes of scheduling enterprise software systems (offering course, event, examination, etc. components), particularly Schedule 25 by CollegeNet which the College already licenses, to understand the advantages to UMBC of available course scheduling software options.

Use of course scheduling software is now seen as a key element in best practice at most North American post-secondary institutions. While use of scheduling software has become the norm among leading colleges and universities, the way such software is deployed may vary considerably from institution to institution.

Leading course scheduling software systems typically support a host of core tasks:

- data collection, record keeping and reporting
- analysis and planning
- scheduling of courses and examinations
- scheduling of students, faculty and rooms
- communication
- enrollment of students (in some cases)

Among the leading systems in wide use in North America are:

- Ad Astra
- Infosilem
- Schedule 25

These systems each provide powerful tools to analyze, plan, communicate, record, and optimize use of institutional space and teaching resources. They support a full range of pedagogical approaches to course delivery with the ability to observe relevant institution policies and standards. In doing so, utilization of space and teaching resources can be optimized at the same time as student access to courses is maximized. These are all compelling institutional outcomes. Achieving them, however, can be a highly involved and labor-intensive process.

Change Readiness and Implementation

Selection and implementation of scheduling software packages is not a trivial exercise. Dedication of time, staff, training and communication will be needed to achieve desired outcomes. Confirmation of project leadership and institutional requirements at the start of the process is the foundation upon which selection and implementation efforts must be built. Discussions will serve to illuminate the extent of changes desired, the benefits and possible challenges of the changes contemplated, and the stakeholders who will be affected by change.

Communication to stakeholders at all stages of the process will be critical to success. Clear delineation of roles and accountabilities of project participants is also essential.

Planning Direction E

Research Scheduling Software Systems

Definition of Requirements

As noted above, defining institutional requirements for scheduling software is a pre-requisite to any successful software evaluation, selection and implementation. Key questions include:

- What are the specific functions which the software must carry out or support?
- What policies, standards or agreements must be observed?
- What are the key challenges currently faced?
- What opportunities or aspirations are not achievable through the current state?
- What flexibility exists for fine-tuning current arrangements?
- Who are the key stakeholders in academic scheduling and how will their advice be obtained?
- Who is the project champion and to whom is he/she accountable?
- What is the institutional readiness for changes to academic scheduling which are being contemplated?
- What resources can be made available to support a change process and what timeline for change is seen as most appropriate?

Functionality of Leading Academic Scheduling Systems

Scheduling software can carry out or support a wide range of functions within the academic scheduling process. What functions an institution will use and how these functions will be used must ultimately be determined based on discussion and confirmation of institutional priorities on how the scheduling process should be managed and what standards, policies and procedures will be appropriate to achieve the agreed upon outcomes. The range of core functions normally seen in comprehensive scheduling software systems are presented in the following table. Information was gathered by contacting the companies directly. Responses from AdAstra and Infosilem were provided to the Consultant Team; responses from CollegeNet for Schedule25 capabilities were provided to UMBC.

As noted above, it is understood that UMBC already has a current license for Schedule 25 software. If so, a detailed review of Schedule 25 functionality to support possible changes to UMBC scheduling policies and procedures is of first importance. This review should form part of the broader review process outlined in Planning Direction B. This will provide a clear understanding of how Schedule 25 software can be best deployed to effectively support desired change to UMBC scheduling practices.

Planning Direction E

Research Scheduling Software Systems

Table A: Functionality Overview of Leading Scheduling Software Vendors

	Functionality	Ad Astra	Infosilem	Schedule 25/Live25
1	Data Recording, Reporting and Sharing including: <ul style="list-style-type: none"> Room capacity and attributes Preferred course delivery model including room requirements Instructor availability Preferred course times Actual course times 	YES Ad Astra software allows users to schedule by space (room capacity, attributes, and preferences), faculty availability/preference, and times (meeting patterns that also provide projected student enrolment and faculty availability).	YES	25Live stores data on room capacities, attributes, etc. If a course comes through with a headcount (expected or registered), it will use that along with any pedagogical requirements (attributes/room features) to find a good location for the courses. The assumption is that once the course makes it to 25Live/Schedule25, the days/times are already set.
2	Room Assignments for Class Sections <ul style="list-style-type: none"> Optimizes room assignment for courses using pre-established course times and room requirements 	YES This functionality is available in "timetabling" module	YES	YES
3	Scheduling of Class Section Times <ul style="list-style-type: none"> Optimizes timing and location of course sections based on preferred delivery model, room requirements, section size, and instructor availability 	YES Ad Astra's software allows users to determine the best times to offer courses based on faculty availability (and preference), student demand, and learning space availability.	YES	Schedule25 will not establish when the course should take place, only where.
4	Scheduling of Students <ul style="list-style-type: none"> Optimizes timing and location of course sections based on preferred delivery model, room requirements, section size, and instructor and student availability <p>Note: Student availability can be based on data from automated degree audit system and/or pre-registration</p>	YES Allows users to optimize timing and location of course sections based on room requirements, sections size, instructor availability, and projected student demand. Data on student availability can also be ingested to help inform when courses should be offered to better meet the needs of the students	YES	NO Schedule25 Optimizer does not track any student data

Planning Direction E

Research Scheduling Software Systems

Table A: Functionality Overview of Leading Scheduling Software Vendors (continued)

	Functionality	Ad Astra	Infosilem	Schedule 25
5	SIS Interface <ul style="list-style-type: none"> Ability to automatically upload all schedule information to resident Student Information System (SIS) Ability to download student course choice data to scheduling software 	YES	YES	The LYNX interface (previously the TCS interface) provides real time updates between the SIS and 25Live on course data. Student data (including student course selection) is not tracked.
6	Loading of Students to Sections <ul style="list-style-type: none"> Ability to upload student enrolments to uploaded schedule in SIS <p>Note: Student enrolments can be based on data from automated degree audit system and/or pre-registration</p>	YES Ad Astra can produce student schedules based on their program of study. Additional UMBC information would be required to confirm specifics.	YES	NO
7	Event Scheduling <ul style="list-style-type: none"> Ability to support “one of” events 	YES Full suite for event management	YES	YES
8	Exam Scheduling <ul style="list-style-type: none"> Ability to schedule final examinations based on exam requirements and course, student and faculty schedules 	YES Ad Astra also provides a course scheduling tool that allows schools to track student progress in their first year	YES	Final exam scheduling is supported, but not based on student/faculty schedules.