

## Scheduling System for Math Department Resources

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## Individual Contribution Breakdown

Table 1: Responsibility Matrix

Allocation by Team Member		Team Member Name		
		Matthew Mooney	Brandon Rozzi	Trevor Smith
Responsibility levels	<a href="#">Project management</a> (10 points)	33%	33%	33%
	Sec.1: Customer Statement of Requirements (9 points)	33%	33%	33%
	Sec.2: System Requirements (6 points)	33%	33%	33%
	Sec.3: Functional Requirements Specification (30 points)	33%	33 %	33 %
	Sec.4: User Interface Specs (15 points)			
	Sec.5: Domain Analysis (25points)			
	Sec.6: Plan of Work (5 points)	33%	33%	33%

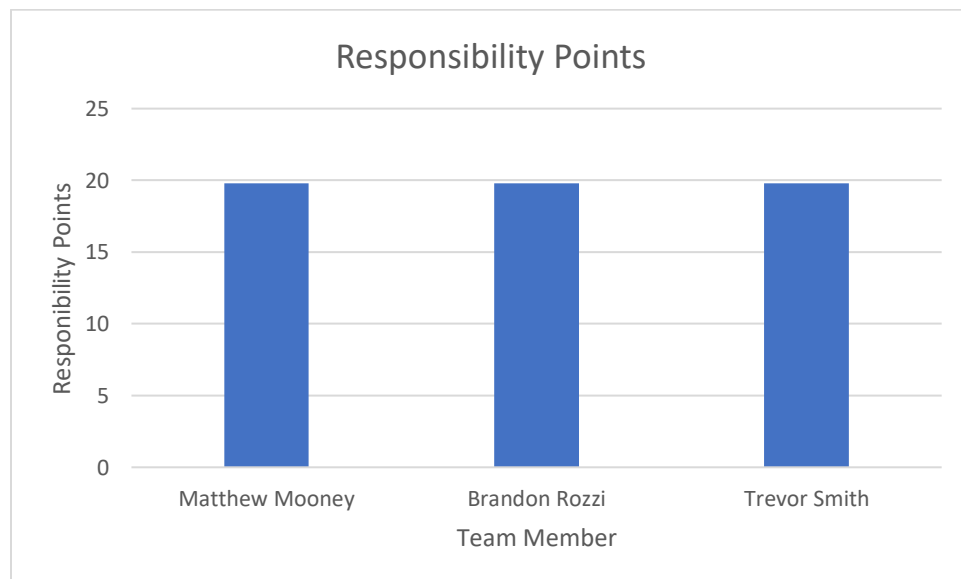


Figure 1: Responsibility Chart

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## Customer Statement of Requirements

The mathematics department requires a system that will allow specific rooms to be reserved as well as a system to aid in tracking Math Assistance Center (MAC) tutors' availability. Presently the department houses three binders for room scheduling. These binders correspond to one to two conference rooms or computer labs. Within the binder is pages upon pages of spreadsheets displaying the available time blocks for the respective room on a day by day basis. When a room reservation is desired, the faculty member must identify the binder, page and time block that corresponds to the reservation they would like to place. The faculty member then reserves the room by filling the time block in with their name, course number, or other identifying information to signify that they have reserved the room. Reservation is restricted to faculty members of the math department only unless a special request is made by a faculty or organization external to the math department.

The proposed solution is one that would automate this process. The system will check and verify that a faculty member or student is currently enrolled at Youngstown State to allow a room reservation. The proposed system will allow for faculty to be able to go online and make reservations from anywhere and at any time. A faculty member is expected to be able to utilize the system to view availability for the conference rooms and computer labs. When they have identified the room and time they desire they should be able to schedule the room immediately. Reoccurring scheduling is an option for cases where the same time block is required for several occasions. The time block is removed from the availability pool once a reservation has been made. Once the Faculty schedules the room, an email notification should be issued as a confirmation that the room was successfully scheduled with the date, time, and room.

The system should allow for users who are not faculty of the mathematics department. Although non-faculty members of the mathematics department can make requests, mathematics

faculty have priority over scheduling rooms and labs. These users can see available rooms and request a reservation. A reservation request should contain a brief reason for the reservation. Once the request has been placed, the department's Administrative assistant must approve the request for the reservation to be scheduled. When a request is pending for a time block the time block is removed from the availability pool. If the request is denied the time block is returned to the availability pool. If the request is approved, the reservation is scheduled, and a notification should be sent to the request as a confirmation that the reservation was scheduled. There are no RSVP requirements stipulated on room reservation. A room reservation can be made up until the time block begins. After a reservation is made a faculty member or student will be able to view their reservation. If a reservation must be changed or canceled the owner of the reservation will be able to delete it. Once a reservation gets deleted the time block should be added back to the available rooms for other people to be able to schedule the room.

There may be such a time at which a room may be closed for maintenance, holiday or other reason. Under such circumstances the administrative assistant can remove time blocks from the availability pool. If a reservation has been previously scheduled for a time in which the administrative assistant needs to close a room, the reservation is lost. The owner of that reservation receives a notification that their reservation has been cancelled with a brief reason for the cancelation.

The room reservation system will also provide basic data analytics. The administrator of the system will be able to view various statistics for several categories. It will be able to collect data on how often a specific room type is requested and scheduled. The system will also collect data on what are the busy days of the week that rooms are scheduled. This analytical system will

provide the department with data that will better help them to adjust room availability and type of rooms that are needed.

The MAC coordinator currently utilizes excel spreadsheets to track the availability of the employees. This spreadsheet contains charts of each day of the week. The chart columns represent a block of time. Rows correspond to a tutor and the cells are populated based on whether the tutor is available at the respective time slot. Another spreadsheet exists to track the classes for which a tutor can provide tutoring. Using these two spreadsheets, the MAC coordinator builds a schedule and enters it into the online scheduling system When Do I Work. This system is used to distribute the schedule to the MAC personnel to know when they are scheduled to tutor in the MAC.

The proposed system will provide analysis of tutor availability to streamline the schedule creation process. At the beginning of the semester tutors submit their availability to the MAC coordinator who will enter the availability into the system along with the capable classes. The coordinator maintains the ability to modify availability in the case that a tutor must change their availability. Once the availability has been entered, the coordinator can view available tutors by day, time, or by classes. This will allow the coordinator to clearly see which tutor is available at a specific time and for specific classes to build a schedule accordingly.

The system will take the information provided by the tutors to help provide a suggested schedule for the MAC. This schedule will insure that every subject offered at the MAC always has a tutor available. A student should be able to go to the MAC at any time and be able to find a tutor for their specific class. With the analytics of the system, if the MAC needs more tutors at a specific time and specific class the coordinator will be able to see what tutors meet the requirements to fill the spot. The system should attempt to create a schedule that spreads the

work hours out among the various tutors. This will prevent any one tutor from getting too many or too few hours. The MAC coordinator will be able look over the proposed schedule that was given by the system. Then the MAC coordinator can then take this schedule into consideration when he or she is making the final schedule for the semester.

## Glossary of Terms

TERM	DISCRIPTION
Availability Poll	Show the available room times for a given class room
Database	A collection of stored related data
Data Analytics	Process of examining data sets to draw conclusions about the information they contain
Drop-down menu	A list of items that appear when clicking on a button or text selection.
Reoccurring scheduling	An option for cases where the same time block is required for several occasions
Sequence Diagram	An interaction diagram that shows how processes with one another and in what order
System Admin	Person who is responsible for the upkeep, configuration, and reliable operation of the system
Time Block	Shows the time of a specific date Ex: 10-11, 11-12
Use Case	a set of actions (use cases) that some system or should or Can perform in collaboration with the
User Interface	How the user and a computer system interact

## System Requirements

### Functional Requirements

REQ-ID	Priority Weight	Description
REQ-1	High	Faculty member or student can view if a room is available or scheduled.
REQ-2	Med	User can schedule a reoccurring reservation of a conference room or computer lab.
REQ-3	High	When a student or non-math department faculty requests a conference room or computer lab it will get sent to the departments Administrative Assistant for approval or disapproval.
REQ-4	High	If a conference room or computer lab is under maintenance, holiday, or other reason and it has been reserved. Then the owner of the reservation will be notified with a description of the reason for cancelation.
REQ-5	Low	A user can view and cancel their existing reservations.
REQ-6	Low	Will give the administrator data analytics for which specific days and rooms get scheduled more often. This will help them to adjust room availability.
REQ-7	High	Tutors can submit their availability at the beginning of the semester along with the classes they can tutor.
REQ-8	High	The administrator can view tutors by their availability and classes they can tutor.
REQ-9	Med	The system will give a suggested schedule to help administration have a place to start when creating the MAC schedule.



## Nonfunctional Requirements

REQ-ID	Priority Weight	Description
REQ-10	High	Sustainability – The system administrator must be able to add additional rooms without modifications to the existing system.
REQ-11	High	Usability – Users should be able to view room availability without signing in.
REQ-12	Low	Usability – The user should be able to reserve a room in as little as three clicks.
REQ-13	High	UX – Room time slots will update in real time with availability.
REQ-14	Med	Scalability – The system should be able to be used for any feasible number of rooms.
REQ-15	High	Reusability – The system should be able to work for any other department that could use it. As well as being able to work every semester.
REQ-16	High	Availability – The system should be available twenty-four hours a day, seven days a week.

## User Interface Layout

The sketch shows a user interface for scheduling a room. At the top left, there is a 'DATE' dropdown menu with a checkmark icon. Below it, the title 'Room Times' is centered. The main area is a table with 'Room #' in the first column and time slots in the subsequent columns. The time slots are '9-10', '10-11', '11-12', followed by an ellipsis, and then '8-9'. The rooms listed are 'Room 1', 'Room 2', 'Room 3', 'Room 4', 'Room 5', and an ellipsis. Each time slot in the table is represented by a box containing the time range. In the original image, these boxes are shaded light gray, indicating they are reserved or unavailable.

Room #	9-10	10-11	11-12	...	8-9
Room 1					
Room 2					
Room 3					
Room 4					
Room 5					
...					

Figure 2: Scheduling a room

Figure 2 displays an illustration of the planned layout of the user interface for scheduling a room. A user selects a date from a drop-down menu and a list of rooms with their available time blocks for that date are displayed. When a time block is reserved, that time block is hidden from the user's view.

## Plan of Work

As of today, we have all split the work of the schedule system evenly as seen in *table 1: Responsibility Matrix*. The scheduling system has a total of nine functional requirements that can be split up evenly amongst the group. Trevor will be handling REQ-6, REQ-7, and REQ-9 all of which will deal with the analytics of the scheduling system. Brandon will be handling the requirements that deal with the user's viewing of the scheduling system. These include the requirements REQ-1, REQ-5, and REQ-8.

Matt will be handling the requirements of room availability and requests. These Include REQ-2, REQ-3, and REQ-4. Our immediate plans are to figure out the web hosting. After that is squared away, we will work on our databases for the system that are needed. Our short-term goal is to get all of this done by the 19<sup>th</sup> of October as seen in *figure 3*. Staying on track with this time line we will have a functioning prototype to present to our client by the end of October. This will give us more than enough time to be able to address any unseen problems before the completed project deadline. After the prototype, we will finish up the second report and that will lead us into the first demo we can present. After the first demo we will begin to implement any nonfunctional requirements that need to be added. Then be able start combining report one and two for the final report for the system. Once all this is completed we will focus on and finish the final version of the scheduling system.

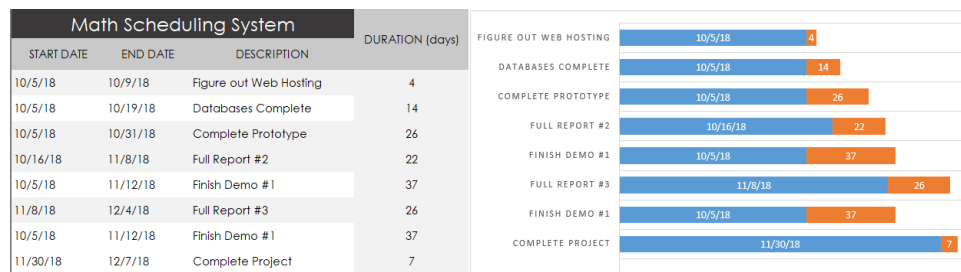


Figure 3: Gantt chart for Scheduling System

## References