COS333: Product Guide for GroupM8

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1 Introduction

GroupM8 is a free web application designed to facilitate the quick and easy formation and organization of study groups for Princeton students. The information upon which the application relies, including courses, student names, and group information, are entirely user generated, allowing for a highly adaptable and personal user experience. Students are able to log in with their netID through CAS and view and manage the groups and classes they are currently in from their personal home page. Each group has its own group page, where members of the group are able to schedule events, add more members, and edit the group's name and description.

2 User Guide

2.1 Navigation Bar

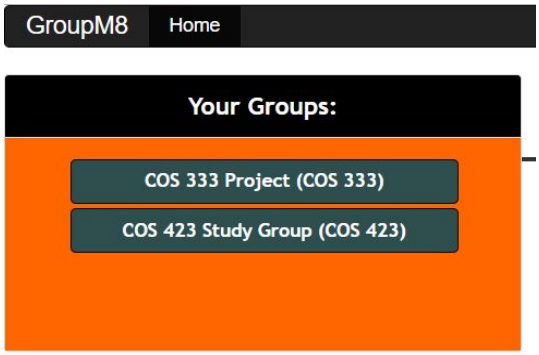
The navigation bar is located at the top of the page and it has several buttons that the user can interact with. If we click on either "GroupM8" or "Home" on the far left, the website will take the user to their home page. On the far right, the navigation bar displays the user's name and a "logout" button. When the logout button is clicked, the user will logout of GroupM8 and would need to log back in through CAS in order to use GroupM8 services again.

2.2 User Home Page

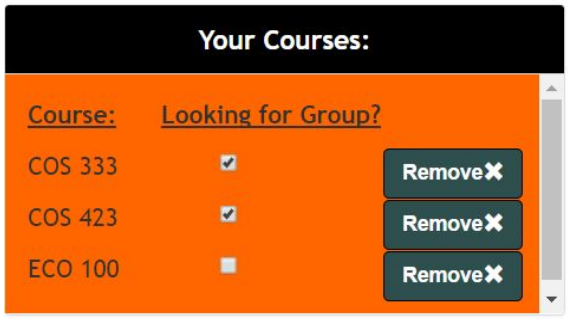
The user home page is the control center for your GroupM8 experience.

On the left side of the screen are four panels. Each panel's dimensions are fixed relative to the window in which you view them.

The first panel,"Your Groups," displays a list of the name of the groups of which you are currently a member, along with the department and course number of the class for which the study group was created. Clicking on any group in the list will take you to the appropriate group's page. When logging in to GroupM8 for the first time, this panel will be empty; as you join study groups for your courses, the panel will automatically be updated to display them.

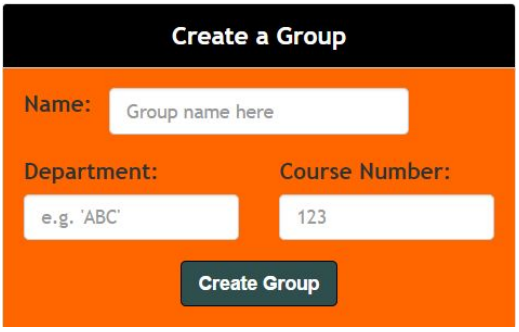


The second panel, titled "Your Courses," displays a list of the courses in which you are currently participating. In addition to the department and course number, each entry in the list also contains a checkbox under the "Looking for Group?" header and a "remove" button. The checkbox can be toggled to determine whether groups searching for new members in a class you are part of will see you. By default, the checkbox is checked, indicating that you will appear in searches; unchecking the box will prevent you from appearing in search results. The "remove" button can be used to remove a course from your list of courses. This will prevent you from appearing in searches for participants in that course, but will not remove you from groups for the course in question; this behaviour is intended to allow you to maintain contact with old groups should you so desire, though you can leave the groups through the group's page as normal (more information on that below). As with "Your Groups," this panel will initially be empty; the next paragraph describes how to add courses.



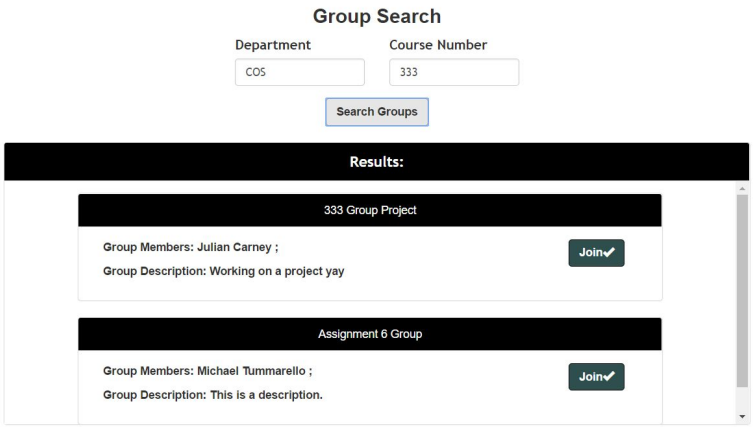
The third panel, "Add a Course," allows you to add courses to your course list. Simply type the three character department abbreviation (e.g. "COS" for computer science) and the course's three digit number in the correspondingly labelled text fields and click the "Add Course" button. This will append the course to your list of courses, with the "Looking for Group" checkbox toggled to checked ("yes") by default. The text fields are not case sensitive - all input is automatically converted to uppercase, meaning there is no

difference between “cos” and “COS.” If you accidentally add the wrong course, simply remove it from your list with the “remove” button detailed above.



The fourth panel, “Create a Group,” allows you to create a new study group. The panel has three fields: the department and course number, which behave the same way as in the “Add a Course” panel, and the “Name” field, into which you should type the name of your new group. The group’s name is case sensitive; its length is capped at twenty characters. The name can later be changed from the group’s page. When you have entered the necessary information, click the “Create Group” button - this will create the group and take you to the group’s page. For your convenience, creating a group in a course which is not currently on your course list will automatically add the aforementioned course to “Your Courses.”

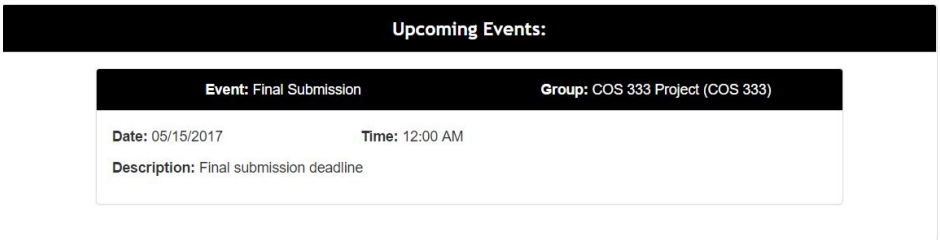
In the top of the main body of the page is your name, which will be displayed in search results and on requests to join groups. Upon first logging in to GroupM8, your name is simply “New User.” This can be easily changed by clicking on the text and typing your desired name, then clicking the “Save Name Edits” button. The name you enter should be two words or fewer, and must be forty characters or fewer in total length. We recommend that you enter a different name immediately upon logging in to GroupM8 for the first time to differentiate yourself from other users. Your name can be changed at any time.



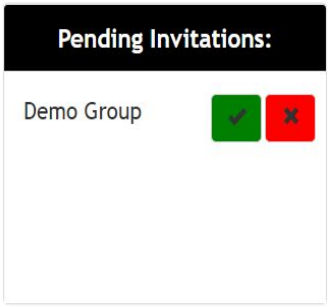
Below your name is the “Group Search” area. This is where you can find and ask to join other people’s study groups. To search, simply fill in the department abbreviation and course number and click the “Search Groups” button. A new panel, titled “Results”, will appear underneath the “Search Groups” button containing all

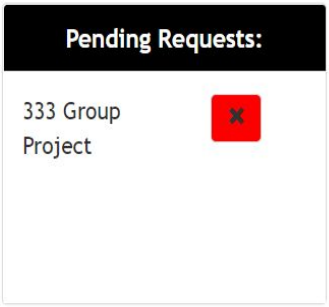
the groups in the course you entered that are currently accepting new members. To join one, simply click the “join” button that appears on the right side of the result group you wish to join. Upon clicking this button, a request to join the group is sent; any member of the group can approve or reject your request to join. You can see the current status of your request to join in the “Pending Requests” panel detailed below.

Underneath the Group Search area is the “Upcoming Events” panel. This panel shows the three events happening soonest across all your groups. The highest event is the event happening soonest, the middle event is the one happening second soonest, and the bottom event is the one happening third soonest.

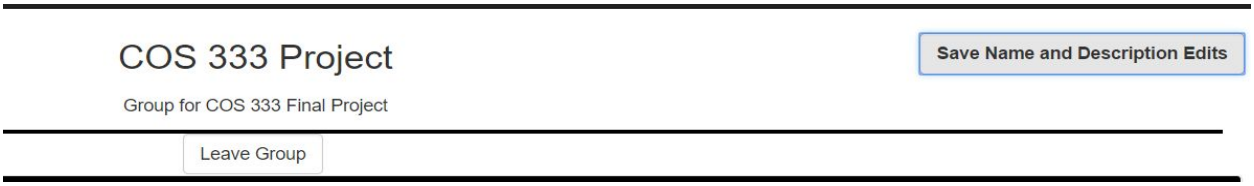


Below Upcoming Events are the two final panels, “Pending Invitations” and “Pending Requests.” “Pending Invitations” displays outstanding invitations for you to join groups, along with buttons to approve or reject each invitation. Approving an invitation will add you to the group that sent the invitation. Similarly, “Pending Requests” displays the requests you have sent to groups that have not been acted upon. If they are approved or rejected by the group to which you sent them, they will be removed from the list. Next to each request is a button to delete the request.





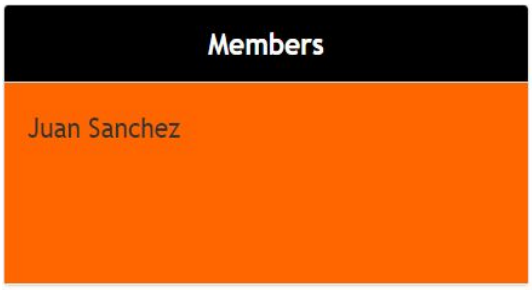
2.3 Group Page



At the top of the group page is the name and description of the group. Initially, the group description will simply say that there is no description. Both the name and description can be edited by clicking on them and rewriting them as desired, then clicking the “Save Name and Description Edits” button.

Below the group’s description, there is a “Leave Group” button. Clicking the “Leave Group” button will take the user back to their home page and the user will no longer be in that group.

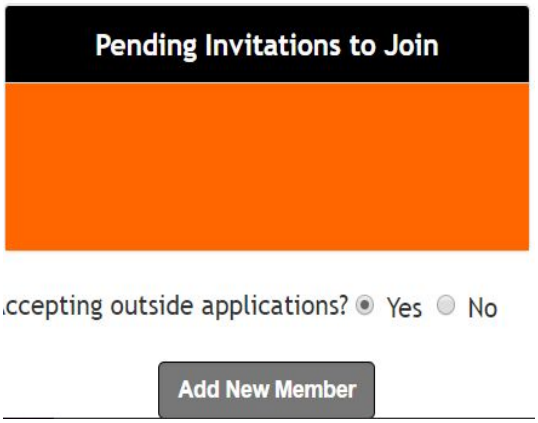
There are three side-panels on the left side of the screen. The first, “Members,” is a list of the members currently in the group.



The second, “Pending Requests to Join,” displays requests from members in the same course as the group who have requested to join it. Next to each rquest are button to approve or reject the request; any member of the group can approve or reject a request.

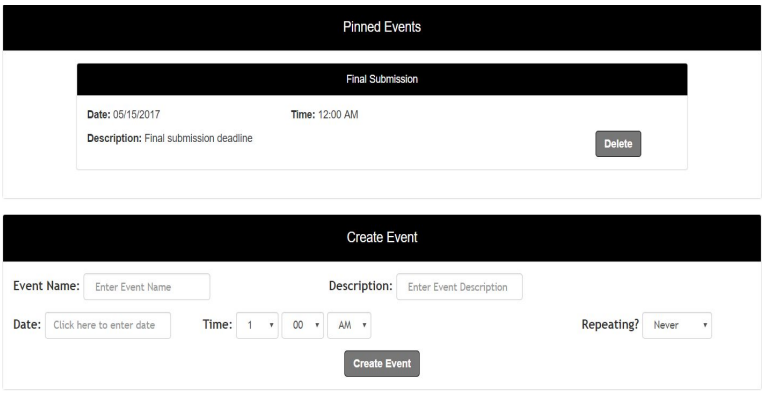
The third side-panel, “Pending Invitations to Join,” lists students who have been invited to the group but have not yet approved or rejected the invitation.

Underneath the side panels are a pair of radio buttons, “Yes” and “No,” labelled “Accepting outside applications?” These buttons determine whether or not the group appears in the results when others users search for groups. By default, the “Yes” button is selected.



In the bottom left of the group page is the “Add New Member” button. Clicking this will take you to the “Classmate Search” page, described later.

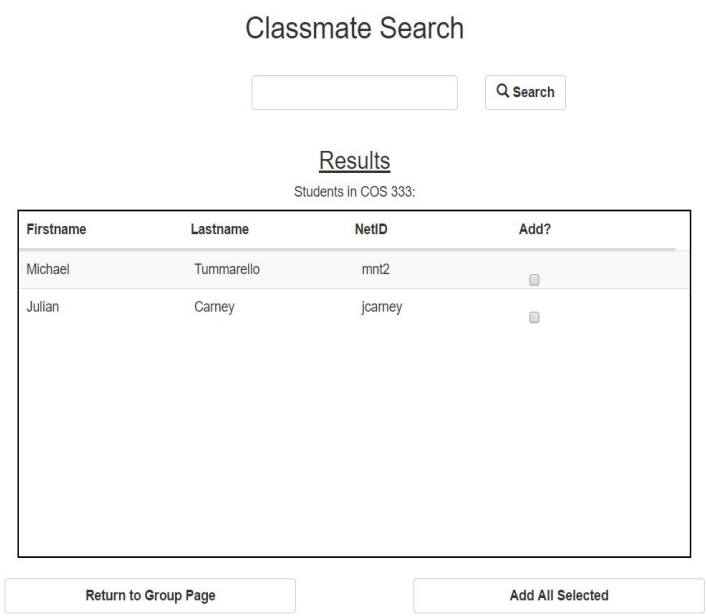
In the center of the page is the “Pinned Events” panel. This panel contains a list of the scheduled events for the group, including each event’s name, description, time of day, date of occurrence, and time of day. Additionally, each event has a “Delete” button which can be clicked by any member of the group to delete an event.



Below “Pinned Events” is the “Create Event” panel. This panel contains all of the forms that need to be filled out to create an event, including whether or not and with what frequency the event should repeat. Events will automatically be deleted from “Pinned Events” once the time at which they are scheduled to occur passes by unless they are scheduled to repeat. Click the “Create Event” button once the fields have been filled out to add the event to “Pinned Events.”

2.4 Classmate Search

In the center of the “Classmate Search” page is a table titled “Results.” The table is automatically filled with the name and netIDs of students looking for groups in the same course as your group. Next to each entry, in the “Add?” column, is an unchecked checkbox. To invite users to your group, simply check the boxes of the users you wish to invite, then click the “Add All Selected” button found in the bottom right of the page.



To refine the search by a user’s name or netID, type part of their name or netID into the search bar above “Results” and click the “Search” button. “Results” will be

updated to only include users with names or netIDs that have that sequence of characters in them.

To return to the group's page, simply click the "Return to Group Page" button on the bottom left of the page.

3 Developer Guide

3.1 FrontEnd

GroupM8's website is built using HTML with Bootstrap, CSS, jQuery, and JavaScript. Bootstrap and CSS is used to create the user interface for the website. A combination of HTML Forms, JavaScript, and jQuery is used to deliver inputs and retrieve data from the backend. In addition, JavaScript and jQuery handles the response of the website whenever a button or link on the website is clicked.

CAS is used to check for user authentication since the website is currently targeted towards Princeton students.

GroupM8's website is constructed using three templates for it's three main pages: home, group, and search. JavaScript and jQuery is used to personalize each of these templates/pages for its' corresponding user/group.

3.2 Mid-tier

The website is a deployment of a Flask app using a WSGI framework. Flask is used to link the frontend (the website) to the backend (Python, MySQL database). JSON was used to conveniently display the data from the MySQL database that is needed for GroupM8's website.

We imported flask-cas to set up our requests to Princeton's CAS server. We used this to require authentication through Princeton's CAS server before a user can successfully log into GroupM8, preventing outsiders from messing with the website. Because all Princeton student accounts are equal, there are no administrative permissions on the website.

Datetime was used for event scheduling purposes to create a date object that could be interpreted by Python. Along with pytz, which calibrates conversion into different

timezones, this is used to properly identify when events should happen, and thus when they should be automatically removed.

3.3 Backend

The backend is implemented using Python and MySQL database. The file __init__.py specifies the actions made whenever a certain “route” receives a request. The MySQLdb module imported allows Python to connect to GroupM8’s database in order to access/update the data.
GroupM8 is deployed on an Apache2 server and hosted via DigitalOcean. Using Apache2’s module mod_wsgi, which provides a WSGI interface that works with Python, we deploy the Flask app to the server. The file groupm8.wsgi imports the Flask app and deploys it on the server. We also enabled logging in groupm8.wsgi, which returns the error logs of Apache2 whenever something goes wrong.

Our server supports multithreading through Apache2’s mpm-event module, which allows for both multiple child processes to be created from a single parent control process, and for each of the child processes to support a limited number of multiple threads. There are also some other small optimizations made to the server to speed up latency and make the server process more efficiently, but it is not configured to withstand extreme server load.

3.3.1 Database Structure

Almost all the data for GroupM8 comes from the user and is organized in several tables on the MySQL database.

Tables:

Users - The Users table is a list of all the users on GroupM8. The table stores each user’s UserID, first name, and last name. The UserID is a unique identifier for each user.

Groups - The Groups table is a list of all the groups on GroupM8. The table stores each group's ID, name, description, department, course number, and availability. The ID is a unique identifier for each group.

Courses - The Courses table is a list of courses for all of GroupM8's users stored with its department, course number, and availability. To identify which user the course belongs to, the table contains a column for the UserID. An additional unique column, ID, is added in order to avoid duplicate entries.

Members - The Members table is a list of members for all the existing groups on GroupM8. Each member entry consists of a GroupID, UserID, the group's department, the group's course number, and the entry's unique ID.

Requests - The Requests table is a list of requests for all the groups/users on GroupM8. Each request entry consists of a UserID, GroupID, type, and a unique ID. The type describes whether the request was made by a group or by a user.

Events - The Events table is a list of events for all the groups on GroupM8. Each event entry consists of a unique ID, GroupID, name, date, time, description, and frequency ("Repeating" column on the table).