

Merit Workshop Classes

Important Note

The description and assessment materials presented below pertain to merit workshop classes. They have been designed by some of our best instructors in this format and therefore characterize the “best practices” for the format and give assessment criteria appropriate for an instructor teaching this format. Experienced instructors who have taught in multiple formats often adopt a mixture of styles, and so the criteria here may not apply at all times. In such cases, the *overall effectiveness of instruction* represents the bottom line when assessing good teaching.

Overview. The Merit Program is a challenging program in calculus for a select group of undergraduates, typically math, science, and engineering majors. Each Merit section is restricted to no more than 24 students. Merit students attend 2-hour workshops either 2 or 3 days a week, depending on the course. These workshops provide ample opportunity for student to student interaction. The Merit TA provides a challenging worksheet for students and circulates around the classroom providing feedback to students as they work. Students are encouraged to “talk mathematics”, thinking aloud and interacting with other students. Different groups of students are encouraged to compare answers since the TA provides few direct answers. Workshop problems are based on the material covered in lecture, but they are designed to stretch each student’s abilities to the fullest extent. The students spend most of the workshop time collaborating in groups, grappling with difficult ideas and problems.

Structure of Merit Courses

Math 120: Calculus and Analytic Geometry I. Students in Math 120 Merit attend a one-hour large lecture Monday, Wednesday, and Friday with all of the other Math 120 students. However, rather than attending a recitation session Tuesday and Thursday like other Math 120 students, Merit students attend two-hour workshops Monday, Wednesday, and Friday with a Merit TA. This Merit TA creates worksheets that should correspond to the material being covered in lecture.

Math 130: Calculus and Analytic Geometry II. Math 130 Merit has no lecture component. Instead, students attend a two-hour workshop every Monday, Wednesday, and Friday. The TA for this workshop assigns homework and gives quizzes/exams.

Math 242: Calculus of Several Variables. Students in Math 242 Merit attend a large lecture Monday and Wednesday with other Math 242 students. Then they attend two-hour workshops Tuesday and Thursday with a Merit TA. This Merit TA creates worksheets that should correspond to the material being covered in lecture.

Based on the goals of the Merit Program, the following are some indications of a successful Merit class:

- Students should be discussing and solving problems within their groups – this means demonstrating and debating solutions, working problems out together on the board, asking each other questions, and comparing methods with each other and with other groups. In general, students should be actively participating and working together rather than relying on the TA. Ideally, the students should become teachers for each other.

- The students should be working on a worksheet that contains problems that are relevant to the current topic in the course. The worksheet should be long enough that it provides plenty for students to do, yet not so long that it seems overwhelming. The problems should be at various levels of difficulty, but the goal should be to get students to improve their conceptual understanding.
- The TA should be circulating among all groups, without spending extra time with one particular student or group. While circulating, the TA should attempt to encourage the participation of all students within each group. Also, the TA may find opportunities to encourage connections between different groups. For instance, the TA may notice that two groups solved the same problem in very different ways. Pointing this out could lead to an important discussion.
- The TA should be asking questions often, even when students have done a problem correctly. The TA should always be challenging students to not only get the right answer, but also understand that answer conceptually. By asking appropriate questions often and asking students to defend their solutions, the TA helps the students to think critically and gain more confidence.
- The TA should be a good listener. By listening closely to a student's response or explanation, the TA will be able to perceive a student's misconceptions and strengths. The TA should also encourage the students to be good listeners when working with each other.
- The TA should have a comfortable, yet respectful rapport with the students. Due to the group setting, the students may get off track once in a while (which is natural in a two-hour class). In fact, this is probably a good sign that they students are comfortable with each other. Yet, the TA should be aware when this happens and the students should respond when asked to get back to work.

These are some other characteristics of a successful Merit class or Merit TA that might not be so obvious in one observation:

- A merit class should have the type of atmosphere where students feel comfortable voicing their own ideas and discussing other students' ideas in a constructive way.
- The TA should pay attention to group dynamics in class, either by forming the groups themselves or encouraging different people to work together. Specifically, it is important to consider the students' ability levels and their leadership characteristics. The groups should be as balanced as possible to promote the most effective interaction.
- While working on worksheets is the primary activity of Merit class, the TA should also be willing to try other activities from time to time.

Obviously a Merit class is unsuccessful if it lacks any of the above characteristics. However, here are a few other obvious signs that something is amiss:

- The TA is lecturing with the students passively listening or taking notes.
- The TA is off by themselves instead of actively circulating and observing the students.
- The room is really quiet with the students working by themselves on worksheets.
- The worksheet only contains basic computational problems that the students can solve with very little discussion or it only contains very theoretical problems that frustrate the students.

Math 120
Merit Workshop W1
Fall 1999 Syllabus

Meeting times: MWF 1-2:50 Altgeld 173

Instructor: April Bucher

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Office Hours: Tuesday 9-11 and by appointment

General Information

The Merit Workshop is designed to give you the opportunity to tackle conceptually challenging problems and be more active in your education. You will be working in groups the entire semester and I will be circulating around the groups asking questions. I will ask questions regardless if you have the right or wrong answer. This act of questioning and answering is going to make you more confident in mathematics. I want there to be debate about worksheet problems in this course. At the same time, I must stress that our classroom has to be a noncombative-atmosphere where students are not afraid to voice their opinion.

Grading

This course counts for 2 credit hours and is listed as Math 199. Your grade will be based on attendance (which includes tardiness) and participation. *Each class is worth 10 points.*

Attendance counts for 4 points each day. If you are tardy, you will only receive 2 points. After 5 tardies, you will not receive any points for attendance. Attendance and promptness is SO important since you will be working in small groups. It is very distracting when group members are gone.

The other 6 points come from participation. Most of the time this is working on the problems and sharing ideas with others. However, there may be some in-class activities that will count toward your participation grade. I will let you know in class when an activity counts toward your participation grade. Each day I will determine how well you have been participating.

You must earn a "B" or higher if you wish to continue in Merit!!

Even though you are welcome to come to my office hours or set up an appointment with me, I encourage you to first ask other students in class about the material. Trust me...you will learn so much more from you peers!

I am looking forward to this semester and hope we can all work together and have a great semester. Best of luck!