More Detailed Instructions for Instructors (MDIFI)

I. Introduction

Over the past few years it has become widely accepted that students learn more from peers and group leaders in a workshop-type environment than in a traditional classroom-lecture setting. We are incorporating the flipped classroom style of education in Mastery/Self-Paced Physics (PHY122P) in order to maximize this interaction.

II. Workshop

The lecture notes (and videos) of the lecture-based PHY122 course are available online, so a student can go through them at their own pace; but the real learning will occur in the workshops. Ideally, all workshops are staffed with two TAs/TIs and should consist of no more than twenty students, broken up into groups of no more than six students.

Each workshop will have a number of enrolled students and some more that just happen to drift in. Students who are enrolled in a section get credit for workshop attendance. It is encouraged that any student attends as many workshops as they need, but not at the expense of the TA/TI, who needs to provide quality support and education for everyone who is assigned to that workshop.

Students who come to attend workshop should be on time, and work in groups. When students arrive, they are matched in reasonably sized groups according to the module that they are working on. If the count hits twenty students you should tell students to come at another time, giving students who are enrolled in that section first preference to stay. However, if a student attends his/her assigned workshop and there are no other students to form a group, then the student should be allowed to work alone.

In addition, students who want to complete their workshop, work alone, or are primarily there for prescreening should stay. One way to do so is to set aside one table for students who are there to complete the work they started earlier, and then proceed to prescreening. Students who are waiting for prescreening should not ask the TA/TIs for help. B&L 208 is a workshop room and therefore relies on peer learning. TAs help when the entire group needs help. B&L 208 should not disintegrate into an individual student help room. If this occurs, pair students together, and enforce group learning. Refer students who are waiting for Prescreen/working alone, but are asking for help, to the tutoring resources provided by the Society of Physics Students (SPS). The SPS runs a free tutoring program from 7-9pm in the POA Library. Aim to help facilitate their learning, not individually tutor.

The reason for limiting the number of students to around 20 is multifold. Beyond a size of twenty, the proximity between groups shrinks dramatically and opens up more avenues for non-work related conversation. Also, as the semester wears on we expect there to be a spread in

the modules that different students are working on. For us to continue to be competent and not spread ourselves too thin we need to limit the number of students in the workshop. With students at a variety of different levels it becomes harder for us to be effective as we attempt to constantly change gears back in forth between modules.

To deal with this spread in module level, it is important that at the start of the workshop you ask the students what workshop module they are working on, and break students up into those groups. It might go against some of your personal principles, but it is necessary that you assign groups for students to work in. At the same time, take a poll as to which students wish to perform a Prescreen for any of the exam modules. In addition, take attendance for the students who are registered for the specific section, so that they will get credit for attendance.

The primary workshop leader (name listed first on the "Simplified Workshop Schedule") is responsible for getting the groups broken up and started on the workshop modules. In some instances it might be obvious that a particular student is ready for an exam module; in this instance a Prescreen is not necessary. In the event where it is necessary, the secondary workshop leader (name listed second on the "Simplified Workshop Schedule") will, once the groups have settled into a rhythm, pick out individual students who requested a Prescreen. Prescreens will be covered in Section III.

As the semester progresses we expect to see a spread in students level in the course. A group can be as small as two (but no greater than six) people. If you come across an individual student in your workshop who is only a module or so behind/ahead the rest of the group you can offer them three options: either work alone on the module they are on, jump (if you feel they are capable of making this)/fallback to the module everyone is working on or leave the workshop and email the head TA so we can set up a group of other students in the same predicament. Here we rely on your discretion and judgment to help them determine what is best course of action.

Now, a more proactive stance on this issue: After a few weeks into the semester, every weekend we shall go through the distribution of where students stand in the course, determine which units are at the wings of the distribution and have enough students (about 7-20) to warrant a "Specified Unit/Topic Workshop." These review-like workshops will run during the normal workshop sessions that have at least two leaders, and a low enough attendance that another 10 students wont go over the 20 student maximum (we will also ask the leaders whether they are willing to do this or not). Using this, we hope to target those stragglers/course leaders that in their own workshop would not have been able to form a group.

In the event of a handful (<7 students) of stragglers falling far behind the rest of the pack we will ask to meet them individually to determine how best to bring them up to par.

III. Prescreens

The purpose of the Prescreen is to determine whether the student is ready to take the module exam. The key question to ask in these instances is whether the student has grasped the key concept of the subject, and whether their mathematical ability is up to the challenge of the exam. The whole point of these Prescreens is to limit the number of the students who just take an exam without really studying. These Prescreens can be a short conversations (3-5 minutes) about a type of problem or concept to delve into the students understanding. Often times, a conceptual question from the text might work pretty well. Another way is to ask a student to explain how they did one of the workshop problems. In order to get prescreened, students should bring their workshop portfolio. A workshop portfolio is a binder containing all the completed workshops that the student has done, including the most recent workshop for which the student is being prescreened. If a student does not do well in the Prescreen, it is important that you fill out a Feedback Form and hand it to the student. (We will cover Feedback Forms in awhile.)

If a student, in your professional discretion, is ready to take a module exam, you are to use the computer, and update their status on the course gradesheet (available under "Grade Center" -> "Full Grade Center" in blackboard) to reflect this. For each student there will a column "Test # R-ABCD" and "Test #". The first column is intended to reflect whether a student is ready to take a test, and if he has taken a test which one. The second column reflects his highest grade on that test. This pattern is repeated for all the modules in the course. After the Prescreen, it is important that in the former you put an "R" for the appropriate module to reflect the student is ready to take the test. Also note that a student can Prescreen for multiple modules without having taken the previous exam module(s); however a student cannot take exam module(s) without having completed the previous ones. When you schedule a student for a test, put the letter S after the R. This way, students are prevented from scheduling multiple tests.

After the secondary workshop leader is done performing all the Prescreens they can inquire as to whether there are any students who have Feedback Forms they need help with. If there aren't any, they can start to work assist the groups with the work they have going on and the normal flow of the workshop can resume. It is encouraged that the workshop leaders start to rely on each other if they are stuck or unable to explain an idea to a student. Often, a different point of view is needed to explain an idea in such a way that it resonates with a student; this isn't something to feel bad about. It is also OK to let a student know that you don't have an answer right away, but will get back to them.

IV. Exam Scheduling

After passing the Prescreen, the student is free to take the module exam[1]. The students will be given the link to view this exam schedule. There are three methods by which a student

[1] As of now anyone with the link can view, but not edit the exam schedule; the link to the google doc is: https://docs.google.com/spreadsheet/ccc?key=0Aqlke9F6kbV6dE9MaXhUZ2p4M283Qnd5ZGxYaDk4X3c&usp=sharing. We will open slots on the spreadsheet two weeks into the future. Once the changes in the TA/TI assignments have been finalized, we shall add all of you as users who can edit.

can schedule to take an exam: Just in Time Scheduling, Immediate Scheduling, and Remote Scheduling.

The first method (Just in Time Scheduling) is straightforward. If a student observes there is an open spot on the exam schedule they can just walk in and take an exam without any formal scheduling. Because of this allowance it is imperative that the grader check the students have passed the Prescreen (and add an S after the R to show that an exam has been scheduled) before administering the exam.

The second method (Immediate Scheduling) can occur as soon as the student has finished the Prescreen. The workshop leader at the end of the Prescreen can offer the student the opportunity to schedule an exam time. There will be a computer on hand in the workshop room to expeditiously facilitate this. When scheduling an exam it is important to input the students ID number and the exam they intend to take in the exam slot. Once an exam has been scheduled the Letter S should be noted in the A-ABCD column. Before taking the first exam, that column should show RS.

If they do not wish to schedule an exam after the Prescreen they can try their luck with the Just in Time Scheduling or send an email and use the last method; Remote Scheduling. If they opt to send the head TA an email, we will need their full name, student id number, the unit number for the exam they wish to take, and their top three preferences for when to take the exam. Once we schedule a test, the R-ABCD column is changed from R to RS.

Now for some math: if there is only one grader exam times are spaced ten minutes apart starting at 2:00 pm every day of the week; the last exam starts at 9:10pm. Thus there is a total of 8x6-5=43 exam slots per day. If there are two graders, exam times are spaced every 5 min, thus there is a total of 8x12-10=86 exam slots per day.

With a course enrollment of 165 we have approximately fifty percent over subscription to these exams. And now some analysis: this fifty percent, in an ideal system, is the amount of failure/over-achieving we can tolerate. But it isn't a perfect system, not all students will take an exam a week. There will be weeks when there are a lot of other midterms and very few students take exams, and conversely there will be weeks when there will be a greater than average desire to take exams. Therefore, we should encourage the students to keep up with the pace of the course.

Students should be told that unlike previous years, we will not add extra time slots at the end of the semester. There will not be any grade-a –thons.

V. Exam Administration

A little before 2:00pm the first student should arrive to take an exam. This requires the first grader of the day to open B&L 208 before 2:00pm. It is important that you check a student

against the official class photo roster to confirm who they are, that they have been cleared by the Prescreen for the module, and that there is an S in the R-ABCD column. Make sure that they not taking any unapproved material for the exam. They are to leave their backpacks, coats, etc. outside in B&L208 and only enter the graders office with their student ID. If a student arrives late, they shall have less time to take the exam. Due to our tight scheduling, we cannot allow any dallying here. Once their identity has been verified and we will provide them with pencil, eraser and a calculator. A randomly chosen exam can be given to the student. Note the exam given to the student in the column "Test # R-ABCD."

As a for instance, if a student is given the B exam for module 1; in column "Test 1 R-ABCD" there should already be an "R-S", you should update this to "R-SBg." The "B" indicates that the exam B has been administered and the "g" indicates that it has not be received back yet. Once the student has completed the exam the "g" should be removed and the score of the exam entered into "Test 1". If a student is retaking a module NO DOT remove the history of what exams he has taken; if the first column reads "R-SD-SC" you need only update it to "R-SD-SC-SBg". This ensures that we do not let a student repeat an exam.

Each exam will be fifty minutes. A little before 2:10pm the second student should arrive. Around 2:50pm the first student should be finishing and the fifth student should be arriving to take their exam. In the ten minutes between 2:50-3:00 pm the grader will need to grade the exam, give quick verbal feedback, fill out a Feedback Form and update the class gradesheet to reflect the students attempt at the exam. The student has the option to look over their graded exam in the grader's office for 5-10 minutes if they want. The student is not allowed to leave the testing room with the question paper/their solutions; their question sheet and solutions are to be filed away in the same room. It is important that we do not allow the integrity of our tests to be compromised. The exams are then filed in the student folder. Note that ANY scratch paper that the student's uses (you can give them an extra blank page) must be stapled to the exam and filed in the student folder.

VI. Grading

There are four things to consider while grading: whether a student understood the questions/concept in question, they knew the correct physics/equations to use, they were able to do the math/algebra correctly and finally whether they ended up with the correct answer. As a rule of thumb if they understood the question, used the correct physics and were able to do the math that should account for 90% of the grade (passing). The remaining 10% is for getting it correct. A more structured rubric will be supplied a little later.

Your feedback on the exam will come in two forms: a verbal section and a written Feedback Form. During your verbal feedback you can show them where they went wrong but do not spend an excessive amount of time pointing out the mistake. In your Feedback Form you can provide some more details, however don't give away the details of the question/solution. It is

important that this entire interaction, including grading, take no more than seven or eight minutes so you have two minutes to tend to the next student coming for the exam. Thus it is recommended that you familiarize yourself with the exam module solutions (to speed up grading) and the workshop modules/textbook (so on the Feedback Form you can tell them to go look at a particular problem/section).

VII. Feedback Forms

Now for the Feedback Forms. These forms are provided after a Prescreen/Exam. On these you should fill out the name of the student in question, the date, and what Prescreen/exam module this is pertaining to. If they passed, write down they passed and what score they got. If they didn't pass, write down the score they got and which topic(s)/subject(s) they made a mistake in and, if possible, what your recommendation for them is.

The information on this Feedback form is to be geared for two purposes. The first is for the student who wishes to correct their mistake on their own. The second is, to leave enough of a clue as to the issue so that a workshop leader can assist them. This Feedback Form is an important aspect of the feedback loop between the student and the grader.

A feature to notice is that there is no opportunity for a student to go over their solutions in detail or request a regrade. Because of the former feature it is important that our graders and our workshop leaders are on the same page regarding the Feedback Form, i.e., provide simple but detailed feedback. And on account of the latter the grader needs to familiarize themselves with the solutions and do their best to avoid unforced errors.

Advisory: We have attempted to do as much planning as possible to create a smooth flow for the course. However, it is inevitable that roadblocks/issues/SNAFUs & FUBARs will occur. It is important that you bring this to our attention as soon as you spot it so we can deal with it.

Physics 122P: Fall 2015

Feedback Form

Date: _____

Student Name: _____

Module Number: _____

Grade: _____

Comments:

Grader Signature: _____

Grader Name (Print)_____

VIII. Gradesheet Guide

Symbol for quiz 1	Best Grade for quiz	Explanation
R	0	R = Student has passed the Prescreen interview for Quiz 1
R-S	0	Student has passed the Prescreen interview for Quiz 1 (R) and was scheduled (S) to take quiz. 1
R-SAg	0	g = Student is taking quiz 1A, g is removed when student gives the test to the grader.
R-SA	70	g is removed after test 1A is graded
R-SN	0	Student did not show (N) first appointment for Quiz 1 which results in a zero and counts as first attempt
R-SA-S	70	Student was scheduled (s) to take quiz 1 a second time
R-SA-SBg	70	Student is taking quiz 1B
R-SA-SB	100	g removed after test 1B is taken student passed with more than 85%
R-SA-SB	80	g is removed after test 1B is taken with grade of 80. Since student failed two times, student needs to pass a more rigorous prescreen
R-SA-SB-R	80	Student has been prescreened 2nd time (R2)
R-SA-SB-R-S	80	Student has been prescreened 2nd time (R2), and scheduled to take a test 3rd time

Purpose: g – To make sure that no test leaves the grading area
S – To prevent students from scheduling test 2
before passing test 1 or scheduling two slots for an exam.

IX. FAQ

Q: How many exams are there in total?
A: As of now the plan is to have 12 module. Each module has about 4-5 exams. (Some units have 4 exams some have 9.)

Q: Will students be allowed to register for multiple exams at a time?
A: No. A student needs to pass the previous unit exam to progress to the next unit exam. However, they can complete multiple Prescreens at a time. Therefore, there any S should be followed by an exam letter (A, B, C, D) before another exam can be scheduled.

Q: How are we going to deal with students in the wings of the distribution, who won't have the numbers to support multiple people in a group?
A: See the last three paragraphs of Section II on Workshops.

Q: I am also a little concerned about how the exams are planned on being administered. Ten minutes might be enough to complete all of the grading and registration responsibilities if one knows the exam solutions cold, but by the middle of the semester we could easily see a new exam each time, considering the random assignment of exam letters and spread in exam numbers.
A: This is something we too are concerned about.

i) As a grader, you need only provide a short verbal explanation and are not required to explain in detail why the student went wrong or to fix their misconception.

ii) It in the guise of the Feedback Form that you will be required to give a precise recommendation for where they went wrong. (Such as: they misread/misunderstood a question, did not understand an underlying concept, were confounded by the math, drew a wrong force body diagram, etc.) And, if possible, provide a suggestion of what to look at.

iii) The grader is not response for fixing misconceptions/filling in blanks in the students understanding. That is what the workshop leaders are for. The grader need only point it out and fill out the Feedback Form. The workshop leaders will be responsible for this. This system relies a little heavily on the effectiveness of the Feedback Form.

Sign In Sheet for PHY122P Workshop

Course PHY122P
Section CRN

Date: _____/_____/_____

Section: M ME MN T TE TN W WE WN R RE RN F FE

TA/TI names: _

	Attended Yes /No	Last Name	First Name	user Name	Workshop module
1					
2					
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