User Manual For Schremmer's MATH 161

Two Ways of Understanding

There are two ways students to look at this class. (See What Students Say Of Schremmer)

- The students who just want to get the credit tries to memorize ***how*** to get the answers to the questions on the exam. But then,
  - How do you know you are using the right procedure for the question?
  - How do you know you remember the procedure correctly?
  - What do you do when the question does not look the same as the one for which you have memorized the procedure?

  Moreover
  - As you go on, it's not just that there is *more* to memorize, it gets *harder* to memorize.
  - Memorization does not *last* so you wind up being *ill-prepared* in the next course.

  Sooner or later, these students realize that memorization does not really work.
- The students who want to learn mathematics tries to figure out ***Why ...***, ***Why ...***, ***Why ...*** a given question *calls* for a certain procedure and ***why*** this procedure does the job. It looks like more work but:

- It is really a good *investment* as later you will always be able to reconstruct what you need on the basis of just sheer common sense.
- So, it gets rid of "math anxiety".
- The more you go, the more connections you find that tie things together, the easier it is to see ***why*** what's going is going.
- It will help you deal with other courses, even outside of mathematics.

Eventually these students realize that this really works.

EXAMPLE 1. A standard problem in Precalculus is to solve a quadratic equation. Now while there is a formula, $\frac{-b\pm\sqrt{b^2-4ac}}{2a}$ which you could memorize, on a exam you may suddenly not be quite sure you remember this "quadratic formula" correctly and then there is the issue that the quadratic formula does not always apply. But equations do not come out of the clear blue sky and if you understand where they come from, and why, you will always be able to reconstruct the quadratic formula without having ever memorized it.

What This Means In Practice

In order to take this class successfully, you must:

- **Never take anything for granted or as going without saying.** You should never accept a statement as TRUE on just somebody's say-so. Only after a *convincing* case has been made, by you, by me, or by anybody else, should you accept it as TRUE. This is exactly like in court where an attorney cannot just say "My client is innocent" and leave it at that. Lawyers and mathematicians alike, as well as you and I and everybody else, we all must make our case.
- **Always be ready to explain the meaning of the words you are using** because, before we can agree on whether what it is that is being stated is TRUE or FALSE, we will first need to agree on *what* it is that is being said. Again just like in court, we won't be able to say "You know what I mean" because the only safe answer to that is "No".

The general idea is not to leave any "grey area" in your mind because it is from grey areas that "math anxiety" arises. You will *know* you are right when you have *convinced* yourself, that is when you have made a case that you are willing to defend against others.

Study the Textbook and ASK, ASK, ASK

1. In order not to waste time by me lecturing (writing the course on the board) and you taking notes, I have written my lectures into a TEXTBOOK,

Reasonable Algebraic Functions (Terse Edition). You can download it for free from `http://www.freemathtexts.org/CCP/161/materials.php` where you can also download it one chapter at a time.

2. You will have to **study each chapter *before* class**. (See the Calendar at `http://www.freemathtexts.org/CCP/161/161Support/161HW-ReviewExamCalendar.pdf`). That way, you will be able to use the time saved by your not having to take notes by asking and discussing questions about the chapter.
So, it is absolutely and totally necessary that you should get a ***printed copy*** of the TEXTBOOK to bring in class because you will have to make annotations, access the INDEX and, in general, go back and forth among chapters. More precisely,

- You must read each sentence—starting with the very first one, ask yourself what sense the sentence makes to *you* and then ***write*** down, however briefly, what makes *you* think that it is TRUE ... or FALSE.
- If the sentence does *not* make sense to *you*, you should make sure you know the meaning of every word in that sentence and if you don't know the meaning of a word, you should ***look up*** the word in the INDEX at the end of the book to find out where in the book the word is explained.
- If you are still having trouble with the sentence, you should ***write*** down the question that you will ask during the next class.

This is what mathematicians call **reading pencil in hand**. By the way, you should not use any "electronics" to help you because they do not really help you.

3. I believe the School has the following rule-of-thumb:
Each "credit hour" of class generates 2050 minutes of work (I do not know where this number comes from but I think it is an industry standard assumption), so for 4 credits that is 8,200 minutes.
Since there are 15 chapters to learn, that means 6 hours and 50 minutes per chapter.
Another way to look at it is that since there are 28 classes altogether, that means you should spend an average of 3 hours and 40 minutes per class.

4. Hopefully, another student will answer your question but in any case that's where I come in: I will be discussing the question and help you figure out what the problem is. However, everybody is different and so, first, *you* will have to help me pin down what it is *you* are having trouble with. Your questions will have to be reasonably *precise* because I cannot give a precise answer to a vague question.

EXAMPLE 2. If you tell me "I can't do this math", what can I possibly tell you? On the other hand, if you ask "Why is the sign right here a $-$?", we have a precise question that we can work on.

By the way, I am quite aware that, at first, this is probably going to be the hardest thing for you to do because your are not used to it. So what I will do is to help you pin down whatever the issue is . . . by asking you questions.

5. Of course, if you would rather not wait until the next class, email me at aschremmerCCP@gmx.com . (Please absolutely do ***NOT*** use my CCP email address ***NOR*** CANVAS.)
Don't *copy* the whole text that you are having trouble with, instead just tell me *where* it is and get to the point.

EXAMPLE 3. Say you have a question about **EXAMPLE** 42 in **Chapter** 5 or **Homework 3**, **Question** 5 or **Review II**, **Question 12**. Once you have written "In Chapter 5, Example 42" or "In Hw3-5" or "in RvII-12", just say what your question is, for instance "Why do we have to change the $\ominus$ to an $\oplus$?"

6. Should all else fail, we will make an appointment to deal with the difficulty you are having. My office hours are *by appointment only* on:

Tuesday	Thursday
11:20-1:00	11:20-1:00

and we will meet in the **Central Learning Lab, Room B1-28**.

Whether answering your question by email or by appointment, I will spend whatever time is necessary to resolve the issue. Moreover, if *needed*, I will make every effort to make an appointment at a time other than the above ones.

7. You should make every effort not to fall behind in your study of the chapters. This is because the stuff in every chapter is based on what came before, not just in the chapter but also in any preceding chapters. So, the in-class discussions of stuff in the current chapter will surely involve stuff that was already discussed previously.
If you are ***absent***, you will have missed your main opportunity for asking the questions you surely need to ask in order to help your understanding of the chapter. What will then happen is that you will have a lot of trouble with what will come later because the later stuff will depend on stuff that was discussed while you were absent.
Similarly, if you are ***late***, and the question you then ask is about something that was already discussed before you came in, I cannot stop the entire class to discuss your question because we need to discuss the questions which have not yet been raised.
So, in taking roll I will keep track of ***lateness*** as well as ***absences***.

8. Accidents can happen and I will try to help you make up for that. But you ought to know that, according to **College Procedure #5**,"*If a student*

has been absent from class for an amount of days equal to the equivalent of two weeks or more, the instructor may initiate a withdrawal (W) after the 20 % attendance reporting period.". In other words, you can miss up to the equivalent of two weeks of class *without any excuse* but you cannot afford to miss more than two weeks of class—*even with an excuse*. See `http://www.ccp.edu/college-catalog/college-policies-and-procedures/registration-and-enrollment#Attendance`

Preparing for the EXAMS

1. Doing the HOMEWORK that comes with each of the 18 chapters in the TEXTBOOK is your first "reality check" on your understanding of the chapter:
i. ***After*** you have read the chapter "pencil in hand", download the corresponding HOMEWORK from `http://www.freemathtexts.org/CCP/161/materials.php`.)
ii. For each question in the homework, find the place in the chapter where the question is dealt with and re-read as *you* deal with the question.
iii. For the homework really to be a "reality check", you ***must*** *explain in the provided space* the ***case*** for your answer. Your answer, right or wrong, will *not* affect your final grade either way because we all ***need*** *to make mistakes* in order to ***learn*** *from our mistakes.*
iv. ***After*** you have come to *an answer for which you can make a case*, check which of the multiple-choices corresponds to your answer. If none of the choices **a**, **b**, **c**, **d** does, there is always choice **e** (None of the preceding). Do ***not*** work back from the choices as you cannot learn anything from that. The response grid is just for me to get a picture of how you did with the chapter.

2. If you have *not* explained your answers, I will mark your homework **NoX** ("**No** e**X**planation") because your lack of explanations prevents me from helping you figure out what went wrong in case you made a mistake. On the other hand, you can ask questions on the HOMEWORK itself, right there along with your explanation. Just put on the first page a **?** next to the question in the response grid to alert me that you have a question there. I will respond right there[1].

3. I will accept late homework but, again, keep in mind that, since the homework is for *you* to check *your* understanding of what *you* studied in the chapter, and since each chapter is necessary for the understanding of the next chapters, you should try to do both the reading and the homework in time. Also, if you are not happy with what you did on a homework, you can

[1] My handwriting is terrible but I will try my best.

always download and print another copy of the homework, re-do it to learn from your previous mistakes and re-submit it and I will look at it.

4. I will keep a record of which Homework you did *not* submit as well as of any **NoX** because neither is serious studying.

5. To get an idea of what the EXAMS will look like and to prepare for them, you should ***first*** download and study the REVIEW QUESTIONS from `http://freemathtexts.org/CCP/161/materials.php` and ***then*** download and study the REVIEW DISCUSSIONS. ***Finally***, do the same with the EXAMS on the website and *my* solutions for these exams. These are EXAMS that were given in previous semesters.

6. After we have dealt with the chapters in each Part, **I**, **II** or **III**, and before you take the EXAM, you will take a REVIEW TEST which has the exact same questions as the REVIEW QUESTIONS and the REVIEW DISCUSSION but with *multiple-choices* for me to give you an immediate feedback. Of course, the results on the REVIEW TESTS will be purely for *your* information and will *not* count towards your final score.

How About The Grade?

I want your final grade to reflect as well as possible what you have learned in this course. As a result, I will ***not*** include any points for attendance, submitting homework, asking questions, being nice, etc.

EXAMPLE 4. Dr. Nice passed all his courses in medical school with the help of points he had been given for attendance, submitting homework, asking questions, being nice, etc. Would you like to be operated on by Dr. Nice?

In order for you to make informed decisions, though, past EXAMS can be downloaded from `http://www.freemathtexts.org/CCP/161/materials.php`. (That won't dispense you from having to *think* about what they are about!)

1. For each one of the three Parts, **I**, **II**, **III**, of the course, on the class following immediately upon the REVIEW TEST there will be the EXAM that counts towards your total score. *No electronics, no written documentation*, nothing but blank paper on which to record your ***explanations***. Not taking the EXAM gets you 0 for that Part.

2. On the day set by CCP for the **Final**, to be posted on `http://freemathtexts.org/CCP/161/posts.php` as soon as it is set by the School, you will be able to ***make-up*** your score(s) on *any and/or all* of the three EXAMS with the understanding that your MAKEUP score(s) will automatically ***replace*** your EXAM score(s) and this ***for the better or for the worse***.

3. Your **Final Total Score** will then be the sum of your score on each of the three parts of the course, either from the EXAMS or from the MAKEUPS if you took it/them. Each score is out of 100 points for a total of 300 possible points.

4. Your **Final Grade** will then be determined by the following rather standard table:

Final Total Score within	Final Average within	**Final Grade**
$[0, 180)$	$[0, 60)$	**F**
$[180, 210)$	$[60, 70)$	**D**
$[210, 240)$	$[70, 80)$	**C**
$[240, 270)$	$[80, 90)$	**B**
$[270.300]$	$[90, 100]$	**A**