Math 305 Fall 2021
Structure of Math III: Number Patterns

Dr. Philip P. Halloran
Professor of Mathematical Sciences
Office: MW 121

Office Hours: T,Tr: 9:30 to 10:30 a.m.
M: 3:00 to 4:00 p.m.
Any time by appointment

Class time: Maria Sanford Room 212 on Tuesday and Thursday 10:50 to 12:00 noon

Phone Numbers: 860–832–2847 Office—I rarely use this number
860–833–6393 Cell phone—this is the best phone on which to reach me
413–525–7888 Home phone
halloranp@ccsu.edu
halloranp@gmail.com This is the better e-mail address

READ THIS SYLLABUS CAREFULLY. YOU ARE RESPONSIBLE FOR KNOWING THIS INFORMATION!
THIS SYLLABUS MODELS THE REQUIREMENTS OF THE NATIONAL COUNCIL FOR ACCREDITATION
OF TEACHER EDUCATION.

This course is intended for students planning to be certified in Elementary Education

Topics which may be considered: Review of operations in mathematics, topics from algebra and
arithmetic, theories of curriculum, teaching, and learning as they relate to arithmetic and
algebra

PURPOSE OF COURSE:
This course will provide you the experience of exploring the above topics through a problem-
solving context. You will be able to see what the National Council of Teachers of Mathematics
(NCTM) calls connections. That is, you will connect the mathematics that you are learning to
arithmetic, algebra, geometry, and trigonometry. This will allow you to see the various
“courses” in mathematics as a unified whole.
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ATTENDANCE:
You are expected to attend ALL class meetings and to participate in all class discussions. All assignments MUST be completed prior to the appropriate class. In the unlikely event that you are unable to attend a class session, please call my cell phone (860)–833–6393 and leave me a message explaining your absence. It’s your responsibility to obtain any notes or other materials and assignments in the event of an absence.

ASSESSMENT:
Over the past several years I have been experimenting with various forms of assessment. This semester I am making further adjustments to my syllabus. First, I will grade class participation. This grade will be an “add on” grade. That is, I will, at the end of each class, make a note of positive class participation. If a student does not participate, I will not take any points off a grade, but if a student does participate then the student’s grade will be increased because of the participation. I will add participation as a “test” grade in computing the final course grade. While I will not give a percentage score for each time a student participates, I will be generous. For example, a student who participates in each class will clearly receive an A grade for participation. So, my advice to you is to participate. Participation can be defined as asking questions about something you don’t understand, for clarification of something that happened in class, offering an explanation about something that happened in class, or any other form of participation. In other words—TALK!

Second, I will give three examinations. They will probably happen on October 5, November 9, and December 14. One will be one third of the semester, the second will be at about the two-thirds of the semester, and the last will be a final. The final will include some material from the first half of the course. The University allows for mid-term grades. I think the mid-term grade might help you to complete the semester with a grade that reflects your achievement. There will not be any “trick” questions, nor will there be anything on the test that we did not cover well in class.

Third, I will have you write a “textbook.” This third requirement is the most difficult. It takes the place of what many of you call homework. This last form of assessment helps you begin to develop well thought out and complete lessons from which others may learn. The assessment is in the form of a well-developed textbook—authored by you. The textbook must reflect what you learned in class that day, but not just a formal writing up of your class notes. You need to reflect and be creative—that is, you need to be able to use what you have learned in class to develop creative and mathematically correct “Lessons” to help you become an effective teacher. The writing of your “textbook” reflects your best ability to develop the meaning of the mathematics for your students. Write it such that you could no better. You can think of the textbook as a series of independent lessons. The School of Education teaches students how to write lesson plans, but they miss something. They miss the content, and how to teach that
content. You learn how to teach both methods and content in this class. I will send you a copy of what I consider a good textbook entry. The entry will be by a good student from a different course. N.B. A good way for you to decide if you have written a good entry to your textbook is to have someone else read what you have written. You might use a friend, a parent or relative. Ask them to read what you have written and then explain it all back to you. If they have a hard time doing that, then you have not written as good an entry as you need to write. In such a case, you would need to pay attention to questions they might have about your lesson, and rebuild the lesson.

Each day add to your textbook, don’t submit a separate document. In this way your textbook expands, and both you and I get to see it as a work in progress—ever growing and expanding. You can change, and improve your entries as often as you wish. There is a purchased textbook. I am better than the textbook, but the textbook gives you another perspective to whatever it is that we are investigating in class. I, your professor and the textbook work together. So, in the textbook you are writing I want you to reference what your purchased textbook says about the topic under consideration. In this way, you get a much broader perspective than you could get from me alone. My goal is for you to be able to leave the class on the last day knowing EVERYTHING that we have studied. Would you want to be taught by a teacher who received a “C-” in this course, or by one who received an “A”. I know the answer.

E-mail me your growing and expanding textbook each week—no later than Sunday evening—I will react to your submission. Send your entry EVERY WEEK, even if you didn’t receive my reaction to your previous submission. Don’t put off writing your textbook entry. THINGS GO COLD VERY FAST! I have been giving this assignment for a number of years, and I have found that if a student puts off submitting the entry, THEY WILL ALMOST CERTAINLY NOT DO WELL WRITING THE TEXTBOOK. Conversely, more often than not, students who write the textbook the same day, or the next day, seem to be able to develop an accurate, and beautiful entry. So, in this sense, you can determine your own grade. Stay up to date, think well, get an A.

Now here is how I grade it. I hate grading! It puts the professor in a very powerful position in your life. The grade you receive in any class will follow you all of your life. My grading is based upon a six-level rubric which has been developed by previous students. I hope you see that the rubric is well thought out and fair. Please consider this rubric each time you write an entry. Look at the rubric; look at what you wrote. If your work does match level 6 of the rubric, then you have probably done a good job. If they don’t match, then you will want to re-write your entry until your writing and the rubric match.
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<table>
<thead>
<tr>
<th>Name/date</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Knowledge of Math</td>
<td>Showing full understanding and Knowledge of Math</td>
<td>Free of errors in the math</td>
<td>A few minor content errors, that do not affect the conceptual understanding of the math</td>
<td>Several content errors which may affect the conceptual understanding of the math</td>
<td>Several conceptual errors which lead to mathematical misconceptions</td>
<td>There are a number of conceptual and content errors demonstrating no, or little, understanding of the mathematics</td>
</tr>
<tr>
<td>II Iconic Representations</td>
<td>There are numerous Iconic representations that develop the meaning of the mathematics well.</td>
<td>There are a few iconic representations that develop the mathematics well.</td>
<td>There are correct iconic representations but development of meaning of the mathematics is superficial.</td>
<td>There are iconic representations related to the topic but don’t develop the meaning of the mathematics.</td>
<td>There are iconic representations but they generally do not relate to the mathematics being developed.</td>
<td>There are no iconic representations.</td>
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<tr>
<td>Score</td>
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<tr>
<td>III Symbolic Representations</td>
<td>There are numerous symbolic representations that develop the</td>
<td>There are a few symbolic representations that develop</td>
<td>There are correct symbolic representations but development of the</td>
<td>There are symbolic representations related to the topic</td>
<td>There are symbolic representations but they generally</td>
<td>There are no symbolic representations.</td>
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<thead>
<tr>
<th>Score</th>
<th>meaning of the mathematics well.</th>
<th>the mathematics well.</th>
<th>not of meaning of the mathematics is superficial.</th>
<th>but don’t develop the meaning of the mathematics.</th>
<th>do not relate to the mathematics being developed.</th>
</tr>
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<tbody>
<tr>
<td>IV</td>
<td>Student Examples</td>
<td>For all topics developed in the class there are additional examples which strongly connect to the classroom examples</td>
<td>For most topics developed in the class there are additional examples which strongly connect to the classroom examples</td>
<td>For some topics developed in the class there are additional examples which strongly connect to the classroom examples</td>
<td>There are few additional student examples, or the examples don’t connect to the classroom examples</td>
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<td>V</td>
<td>Citations</td>
<td>All citations creditable, accurate, and reliable</td>
<td>Most citations are creditable, accurate, and reliable</td>
<td>Some citations are creditable, accurate, and reliable</td>
<td>A few citations are creditable, accurate, and reliable</td>
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<th>30=A (28-30)</th>
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<tr>
<td></td>
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<td>25=A-(25-27)</td>
<td>20=B+ (22-24)</td>
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<td></td>
<td></td>
<td>(20-21)=B</td>
<td>(18-19)=B-15=C+ (16-17)</td>
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<tr>
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<td></td>
<td>C= (14-15)</td>
<td>C=12-13</td>
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<td></td>
<td></td>
<td>D+= (10-11)</td>
<td>D=(8-9)</td>
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<td>10=D</td>
<td>D=6-7</td>
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<td>5=F</td>
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Please use Microsoft WORD as your word processing software. If you don’t own it you can get it from the University for free. Simply contact the HELP DESK and they will help you load the software. And, they will help you use it as well.

Each time you submit your “textbook” please include your NAME, CLASS, DATE, EMAIL ADDRESS. In sending the e-mail, also include your NAME. I will use the e-mail address that you have used sending me your textbook submission.

I hope you will like this class, and that you will find my methods exciting—and, will use them as you enter this wonderful profession known as teaching.

If you need help at anytime, you may call me after 8:00 a.m. and before 9:00 p.m.

Dr. H