Math 102 Syllabus – Fall 2018
Fundamentals of Numerical Mathematics

Course Number: Math 102  
Course Title: Fundamentals of Numerical Mathematics  
Credits: 3  
Catalog Description: A study of the fundamental elementary concepts underlying numbers and number systems and their applications. Topics covered include logic, sets, functions, the natural numbers, integers, rational numbers, real numbers, estimation, number theory, patterns, counting, and probability, in addition to other topics chosen by the instructor. Not open to students with credit for or enrolled in MATH 142, MATH 299 or MATH 346.

Math 102 Sections 1 & 2  
Instructor: Dr. Ken Monks  
Office: LSC 311 C  
Phone: 570 941-6101  
Email: monks@scranton.edu  
Office Hours: See Dr. Monks’s schedule

Math 102 Section 3  
Instructor: Dr. Tom Shimkus  
Office: LSC 474  
Phone: 570 941-4493  
Email: thomas.shimkus@scranton.edu  
Office Hours: See Dr. Shimkus’ schedule

Course Goals: The goals of this course include:

1. To provide students with essential concepts of numerical mathematics for both aesthetical and practical purposes.
2. To provide students with an understanding and mastery of the mathematical skills, concepts, processes, theories, and applications related to fundamental numerical mathematics. Students should strive to obtain a mastery of the subject matter by developing the technical skill necessary to solve the assigned problems. Exams will attempt to ascertain if this objective has been met.

Student Learning Outcomes and Assessment: In each of the following the student will be assessed by grading their solutions to problems on exams or homework assignments that test the corresponding outcome.

1. Students should be able to determine the truth values of compound statements and the validity of logical arguments which involve quantifiers. Students should be able to identify the converse, inverse, and contrapositive of conditional statements.
2. Students should be able to unite, intersect, subtract, complement, and determine the cardinality of sets, to read set-builder notation, and to use sets to compute missing information from survey data. Students should be able to classify relations involving sets and to perform the Cartesian product of sets.
3. Students should be able to solve number theoretic problems involving or related to the concepts of the division algorithm, remainder rules/divisibility tests, prime factorization, primality tests, greatest common divisor, least common multiple, and Euclidean algorithm.
4. Students should be able to convert representations of integers from one base to another, to convert back and forth from base 10 numerals and Roman numerals, to convert representations of rational numbers back and forth from fractions to decimals, and to reduce fractions.
5. Students should be able to solve problems involving or related to the concepts of sequences and patterns,
e.g., random, constant, periodic, arithmetic, superarithmetic, and geometric sequences.
6. Students should be able to solve problems involving the real number system, e.g., problems on absolute value, inequalities, properties of exponents, and arithmetic properties of real numbers.
7. Students should be able to solve problems using various counting techniques: systematic counting, multiplication principle, permutations, and combinations.
8. Students should be able to solve problems in probability theory that involve computing probabilities and odds in experiments with equally likely outcomes, computing expected value, and computing probabilities associated with multistage experiments.

Course Materials
Lecture notes: A brief summary of the basic definitions and theorems we use in the course is available as a printable pdf.


Assistance
If you need help with the course material, you should seek advice within one day of the material being presented in class. You can consult your instructor during his office hours (or by email) or a tutor at the Center for Teaching and Learning Excellence (CTLE) located on the fifth floor of Loyola Science Center (941–4038). In order to receive appropriate accommodations, students with disabilities must register with the CTLE and provide relevant documentation. Students should contact Mary Ellen Pichiarello (570-941-4039, LSC 580) or Rosemary Termini (570-941-7863, LSC 588E) for an appointment. For more information, please visit www.scranton.edu/disabilities.

My Reporting Obligations as a Responsible Employee
As a faculty member, I am deeply invested in the well-being of each student I teach. I am here to assist you with your work in this course. Additionally, if you come to me with other non-course-related concerns, I will do my best to help. It is important for you to know that all faculty members are required to report incidents of sexual harassment or sexual misconduct involving students. This means that I cannot keep information about sexual harassment, sexual assault, sexual exploitation, intimate partner violence or stalking confidential if you share that information with me. I will keep the information as private as I can but am required to bring it to the attention of the University’s Interim Title IX Coordinator, Christine M. Black, or Deputy Title IX Coordinator/Dean of Students, Lauren Rivera, who, in conversation with you, will explain available support, resources, and options. I will not report anything to anybody without first letting you know and discussing choices as to how to proceed. The University’s Counseling Center (570-941-7620) is available to you as a confidential resource; counselors (in the counseling center) do not have an obligation to report to the Title IX Coordinator.

Non-discrimination Statement
The University of Scranton is committed to providing a safe and nondiscriminatory employment and educational environment. The University does not discriminate on the basis of race, color, national origin, sex, disability, religion, age, veteran status, gender identity or expression, sexual orientation, or other status protected by law. Sexual harassment, including sexual violence, is a form of sex discrimination prohibited by Title IX of the Education Amendments of 1972. The University does not discriminate on the basis of sex in its educational, extracurricular, athletic, or other programs or in the context of employment. Students who believe they have been subject to sexual harassment, sexual misconduct or sex or gender discrimination should contact Christine M. Black, Interim Title IX Coordinator, (570) 941-6645 christine.black@scranton.edu or Ms. Lauren Rivera, AVP for Student Formation & Campus Life and Dean of Students, at (570)941-7680 lauren.rivera@scranton.edu. The United States Department of Education’s Office for Civil Rights (OCR) enforces Title IX. Information regarding OCR may be found at www.ed.gov/about/offices/list/ocr/index.html. The University of Scranton Sexual Harassment and Sexual Misconduct Policy can be found online at www.scranton.edu/diversity. All reporting options and resources are available at www.scranton.edu/CARE.
Attendance Policy
You will be expected to both attend and participate in every scheduled meeting of this course. Class participation is an essential component of this course and therefore you must come to class on a regular basis. Should you miss a class for any reason, you are still responsible for all announcements made and all material presented during that class. No cell phone use is allowed during classes.

Class Preparation
When you come to class you should:
1. be prepared to ask questions about any previously covered topic that you are having trouble with.
2. have read any reading assignment for that day and be prepared to ask questions and discuss the material.
3. bring a printout of the lecture notes with you.

Email and the Web
All students in this course are required to have a university email account and are expected to check their email frequently for announcements and other information your instructor may send to you. If you prefer to read your email using your home/personal account instead of your university email account you can forward your university email to your home account. Your instructor will not change your email address in AiM or his email address book from its default university address. So you must either read your university email or forward it to your home account. If your university email account is full and course email messages are not reaching you as a result, it is your responsibility to empty it out and you are still responsible for the contents of any message that is sent to you while your account was full. Instructions for cleaning out your email box can be obtained by calling the university Help Desk (941–HELP). Each student is also expected to be able to access any information that is posted on the world wide web that is related to your course. You may access this information from the mathematics department computer lab in LSC 328. Contact the Help Desk in the computer center if you need assistance.

Calculators
You do not need a calculator in order to take the course, because algebraic simplification is available at the AiM prompts for any questions that require it. Calculators will not be allowed on any of the exams, so it is in your best interest to practice for the exams on your homework assignments without a calculator or other computational aids.

Homework
Almost all homework assignments given in the course will be done by clicking on the appropriate assignment in the homework table. The topics without a due date are homework problems for you to practice as often as you like. While AiM will grade them for you and give you solutions, your grades on those items will not count towards your course grades. You can attempt these assignments as often as you like.

Late Homework
The topics labeled ‘Homework’ (those for which credit is received) cannot be taken more than once and must be completed between the start date and the due date. While AiM will usually allow you to submit and change your answers for 24 hours past the due date shown and receive full credit, no credit will be given if you are unable to submit it during that time for any reason whatsoever, as any homework past its due date is officially late. Therefore, it is in your best interest to complete your homework sets before the due date. If you have any technical difficulties accessing your homework or working on your homework before the due date, you must report your problem to the instructor immediately either by email or in person, so that he has the opportunity to verify and correct the problem before the homework is over. No credit will be given for a homework or question that could not be completed due to technical problems if those problems are not reported to the instructor before the homework is officially due. If you have technical problems with your home computer, you should use a computer in the math lab, library, or other public computer lab on campus to complete your homework.

Make-Up Homework
The point value of the largest of all assigned AiM homework sets is 29 points. We will drop 29 points from the total available number of AiM points in the course for every student, thus effectively ‘dropping the largest homework’ for every student. Thus, there will be no make-up homework for any student, no matter what the reason for missing the homework might be, as all students have one homework dropped. You will receive a grade of zero for any homework you miss. If you miss more than one homework for any reason you will not be able to make them up even though one homework will be dropped.

Make-Up Exams
If you miss an exam for a valid reason your instructor will discuss make-ups with you at that point. The determination of whether a reason is valid or not will be made by your instructor on a case by case basis. If he determines the reason is not valid you will receive a zero for that exam. Thus you should check with your instructor before missing an exam if possible to determine if your reason is valid or not.

Cheating
All exams and homework sets are to be completed individually. You should not use a calculator when taking the graded AiM quizzes, since you will not be allowed to use a calculator during the exams and so you must learn how to do the problems without a calculator. AiM does allow some calculations to be performed at the AiM answer prompt, and you are allowed to use this feature. The use of any other website or software other than AiM during an exam will result in a zero grade for that exam. Any acts of cheating may be dealt with in the most severe manner possible under University guidelines.

Exams
For the students in Dr. Monks's classes, the exams will be taken in HYL, room 102. For the students in Dr. Shimkus's class, the exams will be taken in LSC, room 333. The times of the exams are given in the tables below.

You do not need to bring anything to the lab with you except a pencil. Scratch paper will be provided. You may not use any lecture notes, whether online or on paper. You may not use any software other than AiM while taking the exams. You may not use a calculator, but it is also not required because AiM can do any simplifications that you might need. All other AiM quizzes will be disabled while an exam is going on. For students not taking the exam, this means that you will not be able to practice on AiM while the exam is taking place, so you should plan your study times appropriately.

There are 16 question parts on each of Exam 1 and Exam 2 weighted at 8.77 points each. Each of these exam is worth approximately 15% of your course grade. Exam 1 will only contain questions which could appear on previous AiM homework assignments in the course. Exam 2 will only contain questions which could appear in the previous AiM homework assignments after Exam 1. The Final Exam will consist of 2 parts: Part 1 with 16 question parts covering the material from Number Systems section until Probability II and Part 2 with 20 question parts covering the material from the beginning of the semester until Patterns III section. Part 1 of the Final Exam will be available during the whole period of the test while the Part 2 will become available after the first hour of the period. Together, the two parts of the Final Exam will contain 36 question parts weighted at 9.01 points each. This exam is worth approximately 35% of your course grade. This exam will only contain questions which could appear on previous AiM homework assignments in the course. Any such question may appear on an exam, except for the questions in the AiM Tutorial Homework, which will not appear directly on any exam (although you will certainly need to know how to type your answers into AiM in order to take the exam).

Exam 1
If you are registered for then you will take Exam 1 (50 min) at
Math 102 - 1, TR 2:30pm (Dr. Monks) 2:30pm, Thu, Sep 27, 2018 in HYL 102
Math 102 - 2, TR 4:00pm (Dr. Monks) 4:00pm, Thu, Sep 27, 2018 in HYL 102
Math 102 - 3, MWF 1:00pm (Dr. Shimkus) 1:00pm, Fri, Sept 28, 2018 in LSC 333

Exam 2
If you are registered for Math 102 - 1, TR 2:30pm (Dr. Monks) then you will take Exam 2 (50 min) at 2:30pm, Tue, Oct 30, 2018 in HYL 102.
Math 102 - 2, TR 4:00pm (Dr. Monks) 4:00pm, Tue, Oct 30, 2018 in HYL 102.
Math 102 - 3, MWF 1:00pm (Dr. Shimkus) 1:00pm, Mon, Oct 29, 2018 in LSC 333.

Final Exam
If you are registered for Math 102 - 1, TR 2:30pm (Dr. Monks) then you will take the Final Exam at 12:45pm, Thu, Dec 13, 2018 in HYL 102.
Math 102 - 2, TR 4:00pm (Dr. Monks) 3:00pm, Tue, Dec 11, 2018 in HYL 102.
Math 102 - 3, MWF 1:00pm (Dr. Shimkus) 12:45pm, Wed, Dec 12, 2018 in LSC 333.

Note. The problem sets (assignments) and the practice exams will not be available during the times when other exams are scheduled, so you will not be able to practice on AiM during the times above.

How your grade is computed
There will be two in-class exams, a cumulative final exam, and 19 graded AiM homework assignments. Each part of each problem on every AiM Homework will be worth one point. There are a total of 324 points available on all 19 homework assignments (but they are not evenly distributed among the 19 homework assignments, so every part of every problem has the same value but every homework does not). There will be no extra credit projects of any kind, so it is essential that you do well on all your AiM homework assignments and exams.

Using the tables below, a numerical grade is computed which in turn is converted to a letter grade.

**COMPOSITION OF COURSE GRADE**

<table>
<thead>
<tr>
<th>Points</th>
<th>Final Exam</th>
<th>Exam 1</th>
<th>Exam 2</th>
<th>AiM Homework</th>
<th>Dropped Points</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate percentage</td>
<td>324.4</td>
<td>140.3</td>
<td>140.3</td>
<td>324</td>
<td>−29</td>
<td>900</td>
</tr>
</tbody>
</table>

**GRADING SCALE WITHOUT THE CURVE**

| If your numeric grade is greater than or equal to… | 93.00 89.00 85.00 82.00 78.00 74.00 70.00 67.00 63.00 60.00 00 00 |
| Your letter grade will be… | A A- B+ B B- C+ C C- D+ D F |

**GRADING SCALE WITH THE CURVE**

| If your numeric grade is greater than or equal to… | 91.25 86.25 81.25 77.50 72.50 67.50 62.50 58.75 53.75 50.00 00 00 00 00 |
| Your letter grade will be… | A A- B+ B B- C+ C C- D+ D F |