



The University of New Haven
The College of Arts and Sciences
Department of Mathematics and Physics

Course: MATH 1104-1

Title: Quantitative Reasoning

Semester: Fall 2014

Meeting Times: MW 8:00–9:15am, F 9:00–10:40am

Classroom: Kaplan 107 (MW), Maxcy 118A (F)

Credit Hours: 3

Instructor Contact Information

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Office Hours: MW 1:30pm–3:00pm

MATH 1104-1 Quantitative Reasoning Syllabus

Course Description

Pre-requisite: Placement into MATH 1104 or higher, or having completed MATH 1103 or equivalent with a C or higher. Topics include: sets, logic, elementary functions, number systems, functions and graphs, enumeration and elementary probability. This course does not serve as a prerequisite for any other course in mathematics. MATH 1104 may not be taken for credit by students whose degree program requires any further mathematics course.

Required Text

Thinking Mathematically, Blitzer, Pearson, 0-321-64585-5, (2011).

Course Goals

The course, MATH 1104-1, introduces students to problem solving using methods that are not directly related to the traditional algebraic formulary that dominates the elementary mathematics curriculum. The course is designed to develop an understanding and appreciation of mathematical thought, as well as an ability to solve understand and devise solutions to a range of elementary real-world problems in mathematics.

Course Topics

Topics covered include:

1. Problem solving and critical thinking: An introduction to formal reasoning, including deductive and inductive reasoning.
2. Set Theory: Basic concepts, including subsets, intersections and unions, and working with set operations.
3. Logic: A formal treatment of the elements of logic including statements and quantifiers, negation, compound statements and connectives, truth tables, the equivalence of statements and DeMorgan's Laws.
4. Number theory: Prime and composite numbers, integers, rational, irrational, and real numbers, including working with sequences of numbers.

5. Graphs and functions: Linear, quadratic and exponential functions and their graphs.
6. Measurement: Fundamentals of length, area and volume, and measures associated with mass and temperature.
7. Probability: Permutations and combinations.
8. Geometry: Points, lines, angles, and triangles, along with measure of length and area. Tessellations.
9. Mathematical systems: Aspects of symmetries and groups.

Goals for Student Learning

Students will have

1. An understanding and ability to work with the basic tools of formal reasoning as well as to recognize errors in reasoning and be able to recognize fallacies as well as avoiding common logical mistakes.
2. An ability to work with foundational mathematical structures such as sets, mathematical symmetries and patterns in elementary mathematics.
3. A working knowledge of techniques for reliably manipulating numbers, number systems, and numerical quantities, along with working with measures of geometrical and other physical quantities.
4. A foundational understanding of probability.

Course Requirements and Assessments

Each student is assessed based on a computed point score from 0 to 100. The score is based on exams, assigned papers, and bonus assignments, as follows:

1. *Examinations*: 1 quiz (5 bonus points), and four exams (100 points each) consisting of: Exam 1, the midterm, exam 3, and the final exam, for a total of 400 points.
2. *Participation*: Active engagement in classwork and class discussion is a necessary part of this class (please review the Assessment section).

Exams

During the semester there is one quiz and four exams. The quiz, worth 5 bonus points, is given early in the semester before the drop date to allow student to determine whether the course is appropriate for continued study. The two exams (Exam 1 and Exam 3) each cover only a limited set of topics, while the midterm examination paper and the final exam are comprehensive, i.e., they cover all material studies up to the time of the exam.

All exams is closed book and notes with the exception of the midterm which is open book (but not open notes). The midterm paper is intended to provide an extensive assessment of the student's ability to work with the material and to reason over a broader range of problems. Because of this, the level and quality of work is expected to be high. The comprehensive final exam is closed book and notes and covers all material which is discussed in the course and is given on the scheduled exam day. The final exam covers very much the same material that is covered during lectures in examples or during recitation on the assigned homework problems. For this reason, participating fully in class, and working all of the assignments is an essential part of being able to pass the final exam.

The course grade is based on the average score obtained on all four exams (for a total of at most 400 points). The student's total score is obtained by averaging these points over the four exams and then adding any bonus points to the average score to yeild the the total point score (TPS). The TPS is the basis for grade assignment.

Bonus Assignments

Bonus assignments are typically given as extra problems on exams, or else are given during the course of the semester, to be turned in at the required time. Bonus problems are more difficult and challenging problems which are available for students to gain further in-depth experience, pushing the limits of the course. These problems usually have point values from 1 to 5. Students are not required to attempt these problems, however it is to the student's benefit to attempt these since they are counted after the all other assessment results are averaged. Thus bonus assignments serve to increase a student's score. Note that the first quiz is counted as a bonus score.

Scoring and Course Grades

The letter grade is based on the student's total point score (TPS) for the semester. The TPS is computed using the average of all points earned on all exams plus all of the bonus points which the student has earned. The class letter grade is assigned based on

TPS	Grade	TPS	Grade
97.5 – > 100.0	A+	77.5 – 80.0	C+
92.5 – 97.5	A	72.5 – 77.5	C
90.0 – 92.5	A-	70.0 – 72.5	C-
87.5 – 90.0	B+	67.5 – 70.0	D+
82.5 – 87.5	B	60.0 – 67.5	D
80.0 – 82.5	B-	0 – 60	F

All computations use single precision arithmetic, with scores rounded to the nearest tenth of a point. A TPS which falls on or below a grade boundary is assigned a grade based on a valuation of the extent to which a student actively participated in the class during the semester, including the number of bonus problems attempted (meaning that even a score of 0 on a bonus problem is significant). For example, a rounded score of 90 can be assigned an A- or B+ grade. For this reason active class participation is an important part of the assessment process. Information about university grades can be found at <http://catalog.newhaven.edu/content.php?catoid=4&navoid=639>.

Class Participation (Assignments and Homework)

There is no credit given for homework assignments (i.e., homework is not graded), however since the comprehensive final exam is based on the material and problems which are to be found in the homework assignments, it is beneficial to attempt all assigned problems. Students are required to provide solutions to homework problems in class on the day the assignments are due.

Because of the importance attached to problem solving and because exam results are not curved or normalized, students are strongly encourage to attempt as many bonus assignments as possible. These provide a mechanism for improving performance; however, unlike 'curving' exam results, this approach requires that the students take the initiative to improve their scores. It is important to attempt bonus problems since these add to your final score.

Example: A student earns the following grades in MATH 1104-1: 3 bonus points for the quiz, 70 points on the first exam, 78 points on the midterm exam, and 83 points on third exam, and 93 points on the comprehensive final exam. In addition the student attempts three bonus assignments worth 5 points each, earning 0, 3, and 5 points on each of these. The student's score is then computed as

$$\frac{(70 + 78 + 83 + 93)}{4} = \frac{324}{4} = 81.0$$

then the bonus points earned, i.e., $(3 + 0 + 3 + 5) = 11$ are added to this score, yielding a final score of 92.0. Based on this final score, the student is assigned a **A-** letter grade.

Further Considerations and Rules

- *Electronic devices:* The use of phones and electronic devices, except in an emergency or unless otherwise approved by the instructor, is disallowed in class. The use of any electronic device, except those explicitly approved for use during any exam, will result in grade of 0 on that exam. If in doubt, please inquire prior to using the electronic device.
- *Late Papers:* Any material handed in late without having obtained prior approval or without having a valid university excused absence (e.g., a signed medical excuse) results in a 90% factor being applied to the students score on that paper for each day, or part of each day, that it is late. All papers are due at the start of class. Material handed in over one week late without prior approval is not accepted.
- *Scheduling conflicts* It is the student's responsibility to contact the instructor concerning any scheduling conflicts which may result in late papers, or other scheduling conflicts, e.g., an absence for an exam.

Course Outline Schedule

Fall 2014 classes are from Monday, August 25 to Monday, December 11. The last day to drop classes is Monday, September 8. Semester holidays are on: Labor Day, September 1; Fall Break, Monday/Tuesday October 13–14; Thanksgiving, November 27 – November 30. The final exam is scheduled for Saturday, December 13 at 8:00am to 10:00am in Kaplan 107.

The class schedule is available online at <http://math.newhaven.edu/kolibal>. Assignments are due on the date they are posted, i.e., an assignment posted for Monday, August 25 is due at the start of class on Monday, August 25. Changes in the schedule are annotated in **color**.

The Undergraduate Academic Calendar is at <http://www.newhaven.edu/academics/schedules-registration/undergraduate-academic-calendar-2014-2015/>, and the date for final exam dates can be found at <http://www.newhaven.edu/academics/schedules-registration/fall-2014/fall-finals/>. A summary of important dates can also be found at <http://www.newhaven.edu/academics/12592/>.

Department, College and University Expectations and Policies

Adding/Dropping a Class

Prior to the Add/Drop deadline, a student may withdraw from registration in the course through the Registrar's Office or system. The students name is removed from the class roll, and the instructor is not involved. After the Add/Drop period, a grade of W will be considered under appropriate circumstances. A grade of W will not be given once the final exam is attempted. The Add/Drop deadline is Monday, September, 8, as discussed at <http://www.newhaven.edu/academics/schedules-registration/fall-2014/>, and the University Add/Drop policy is outlined at <http://catalog.newhaven.edu/>.

Attendance

University attendance policy guidelines require that:

All students are expected to attend regularly and promptly all their classes, appointments, and exercises. While the university recognizes that some absences may occasionally be necessary, these should be held to a minimum. A maximum of two weeks of absences will be permitted for illness and emergencies. The instructor has the right to dismiss from class any student who has been absent more than the maximum allowed. After the last date to drop as published in the academic calendar, a student will receive a failure (F), if failing at that point, or a W, if passing at the time of dismissal.

Students are to adhere to the policy attendance policy guidelines outlined in the University Catalog at http://catalog.newhaven.edu/content.php?catoid=4&navoid=639#General_Policies.

Academic Integrity Policy

This class fully adheres to the Academic Integrity Policy:

Academic integrity is a core university value that ensures respect for the academic reputation of the University, its students, faculty and staff, and the degrees it confers. The University expects that students will conduct themselves in an honest and ethical manner and respect the intellectual work of others. Please be familiar with the UNH policy on Academic Integrity. Please ask about my expectations regarding permissible or encouraged forms of student collaboration if they are unclear.

Students are required to adhere to the Academic Integrity Policies specified in the Student Handbook at <http://unh-web-01.newhaven.edu/wwwmedia/viewbooks/studentlife/handbook/studenthandbook.html>.

Coursework Expectations

This course will require significant in-class and out-of-class commitment from each student. The University estimates that a student should expect to spend two hours outside of class for each hour they are in a class. For example, a three credit course would average six [6] hours of additional work outside of class. Coursework expectations are detailed at http://catalog.newhaven.edu/content.php?catoid=4&navoid=639#General_Policies.

University Support Services

The University recognizes students often can use some help outside of class and offers academic assistance through several offices. In addition to talking with your instructor and advisor, we recommend you contact the Office of Academic Services (OAS) for help with your academic studies (call 203.932.7234 or visit Maxcy 208). The Center for Learning Resources (CLR) in Peterson Library is equipped to help you with writing, mathematics, biology and physics.

Special needs

Students with disabilities are encouraged to share, in confidence, information about needed specific course accommodations. The Campus Access Services office (CAS) provides comprehensive services and support that serve to promote educational equity and ensure that students are able to participate in the opportunities available at the University of New Haven. Contact 203.932.7331, Sheffield Basement, or http://www.newhaven.edu/student-life/CampusLife_StudentAffairs/Campus_Access_Services/.

Religious Observance Policy for Students

The University of New Haven respects the right of its students to observe religious holidays that may necessitate their absence from class or from other required university-sponsored activities. This class

fully adheres to these ideals and responsibilities:

Students who wish to observe such holidays should not be penalized for their absence although, in academic courses, they are responsible for making up missed work. Instructors should try to avoid scheduling exams or quizzes on religious holidays, but where such conflicts occur, should provide reasonable accommodations for missed assignment deadlines or exams. If a class, an assignment due date, or exam interferes with the observance of such a religious holiday, it is the student's responsibility to notify the class instructor, preferably at the beginning of the term, but otherwise at least two weeks before the holiday. In a similar vein, students who will not participate in other required activities due to religious observance should notify the staff or faculty member who oversees the program with the same lead-time.

More information about religious observance policies can be found in the Student Handbook.