

Syllabus

Instructor: Dr. Alexander Krantsberg

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Office: Bisdorf, Room AA 352

Class Time: Mondays and Wednesdays, 12:30 PM - 4:00 PM

Classroom: Bisdorf, AA 354

Office hours: Mondays and Wednesdays, 4:00 PM - 5:00 PM; Bisdorf, AA 354

Important Dates

June 29

July 6

July 24

August 3-9

August 5

Classes begin

Last day to drop a class with a tuition refund

Last day to withdraw without grade penalty

Last week of classes

Final Exam

Course Content

(visit <http://www.nvcc.edu/academic/coursecont/summaries/MTH151.pdf> for details)

Course Description

MTH 151– Introduces topics in sets, logic, numeration systems, geometric systems and elementary computer systems.

Course Purpose

The purpose of the course is to give you an appreciation for the uses of mathematics in contemporary world and to develop your ability to solve some mathematical problems.

Prerequisites

Competency in Math Essential Units MTE 1-5 and the placement test, or successful completion 5 units in an MTT course, or a minimum mathematics score of 520 on the SAT or a minimum score of 22 on the ACT taken within the last two years.

Course Objectives

After completion this course, you should be able to:

- perform operations on sets and Venn diagrams and solve problems utilizing set operations
- analyze a statement for logical structure and truth value
- discern the validity of arguments
- demonstrate the relationship between place values and number bases
- distinguish between Euclidean geometry, non-Euclidean geometry
- apply topological concepts

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- apply computer concepts

Major Topics

A. Sets

1. Set notation
2. Relations-equality, subset, disjoint sets
3. Operations-union, intersection, complement
4. Venn diagrams
5. Applications-survey problems

B. Logic

1. Statements
2. Connectives
3. Propositions (negation, conditional, converse, inverse, contrapositive)
 4. Truth tables
 5. Validity of arguments
 6. Logical equivalence

C. Numeration Systems

1. Historical perspective of numerical systems
2. Place value systems
 - a. Binary
 - b. Octal
 - c. Decimal
 - d. Hexadecimal
3. Conversion between bases
4. (optional) Computation in bases other than decimal

D. Geometry

1. Euclidean geometry - concepts such as area, perimeter, and volume
2. Non-Euclidean geometry
 3. Topology - concepts such as genus, networks, tiling, and the four color theorem

E. Computer concepts - required use of one or more of the following:

1. Mathematics software package
2. Spreadsheet
3. Database
4. Mathematical applications of the Internet

E. Optional topics

1. Sequences and Series
2. Chaos
3. Fractals
4. Consumer mathematics

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5. Metric system
6. Number Theory

Textbook*

Math for the Liberal Arts, 2nd Custom Edition, by Miller, Heeren and Hornsby
(taken from Mathematical Ideas, 12th edition by the same authors)

*The same textbook is used for MTH152

You can purchase in the bookstore one of the following two items.

1. **NOVA Special Bundle** - Textbook with access to the online software MyMathLab for 1 year - ISBN 0558554679
2. **Textbook only**: ISBN-13: 9780321693815

You also have the third option:

3. **MyMathLab –Standalone Access Card** that gives you access to the electronic version of the textbook. To purchase the card online you need the Course ID:

krantsberg26895

(for more information visit www.coursecompass.com)

MyMathLab

MyMathLab is a valuable tool for study and review. It is highly recommended, although it is not required for this course. There will be an extra credit of up to 10% for homework if you complete it online by using MyMathLab.

If you purchased access to MyMathLab, you can access it at www.CourseCompass.com

The **Course ID: krantsberg26895**

Calculator

A scientific calculator with statistical operations is recommended for this class. If you have to take Precalculus I MTH 163 or Statistics MTH 241, a graphing calculator such as TI 84 is a better choice.

Grading Policy

Grading Categories

- Homework and Class Assignments - 10%
- Quizzes - 15%
- Exams - 45 %
- Final Exam - 30 %

Course Grade

The course grade will be a letter grade:

- A - 90%-100%
- B - 80%-89.9%
- C - 70%-79.9%
- D - 60%-69.9%
- F - below 60%

No audits are given in this class. **The last day to withdraw with refund is July 6, 2015. The last day to withdraw without grade penalty is July 24, 2015.** You are responsible for doing all paperwork before these last dates.

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Attendance:

It is very important to attend this class. If you miss no more than two classes, your lowest grade on homework, quizzes, or exams will be dropped. My experience shows that regular attendance and active class participation, in most cases, results in a passing grade.

Grading Assignments

Homework: Problems will be assigned for every section covered in class. The homework is due the following week of a class. Do not forget to put your name, the text book section, pages and the problem numbers.

Note: If your average grade on the tests is more than 70%, you will get a 5% extra credit for your homework.

Quizzes: We will have quizzes on most class days when there is no test. You can make up two quizzes.

Tests:

There will be four tests, one hour each.

The tentative schedule for the tests is this.

| | |
|---------------|----------------|
| Test 1 | July 6 |
| Test 2 | July 13 |
| Test 3 | July 20 |
| Test 4 | July 27 |

Please let me know in advance if you are not able to attend the class on any of these days. You may make up a test within two weeks after the test. It is your responsibility to schedule the make-up test with me.

Final Exam

The final exam is scheduled for **August 5, 2015 from 12:30 AM to 3:00PM**. The exam will be comprehensive and cover all course material.

All students are expected to attend the final exam. There is no make-up for the final.

Exam and Test Policy

You may not share calculators during exams or quizzes. You may not use cell phones as calculators during exams and quizzes.

Cheating – receiving or giving unauthorized help- will result in a score of 0 on that exam.

Classroom Behavior

You should silence cellular phones. No texting during class time.

Inclement Weather or Other Emergency Events

If the college is closed, a text alert will be sent to cell phones registered on NOVA Alert, a notice will be posted on the College's website www.nvcc.edu/emergency. You can also call the College Call Center at 703.323.3000.

Special Needs and Accommodations

Please address with me any special problems or needs at the beginning of the semester. If you are seeking accommodations based on a disability, you must provide a disability data sheet, which can be obtained

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from the counselor for special needs, who is located in Bisdorf (AA) 229, phone (703) 933-1840. More information may be found at the following website: <http://www.nvcc.edu/current-students/disability-services/index.html>

Note: The syllabus is subject to change.

Course Outline
 (Subject to change at any time)

| Week | Date | Section | Assignment (due the following week) |
|-------------|-------------|---|---|
| 1 | 06/29 | Section 2.1-Basic Concepts Section 2.2 Venn Diagrams and Subsets Section 2.3 Set Operations | pp.47-49: 1,2,9,15,19,21,22,29,35,38,39,42,45,47,51,57,58,59,61,63,69,71,77,85,87,93,94 pp.54-55:1,7,11,13,15,19,21,23,25,30,33,35,39,41,43,45,47,51,53,57,59,62,63 pp.65-68: 1,3,7,11,17,27,29,31,41,44,49,56,59,63,65,67,71,73,77,79,83,85,93,99,104,112,114,117,123,133 |
| 1 | 07/01 | Section 2.4 Surveys and Cardinal Numbers Section 3.1 Statements and Quantifiers | pp.71-74:1,3,5,11,17,18,19,21,23,27,31 pp.88-90:1,3,7,11,13,19,23,27,28,29,30,33,35,39,41,46,47,49,51,54,57,65 |
| 2 | 07/06 | Section 3.2 Truth Tables Section 3.3 The Conditional Test 1 | pp.99-100: 1,5,9,11,15,17,21,23,25,27,31,33,35,39,41,46,47,49,51,53,57,63,65,67,71,77,79,81 pp.107-109: 3,7,11,21,23,27,29,33,36,37,39,41,49,51,55,57,61,69,71,75,81,83,87,91,97 |
| 2 | 07/08 | Section 3.4 The Conditional and Related Statements Section 3.5 Analyzing Arguments | pp.114-115:3,9,11,,3,15,25,29,31,33,35,41,45,47,51,53,55,57 pp.119-120:3,5,9,11,15,17,23,25,27 |
| 3 | 07/13 | Section 3.6 Analyzing Arguments with Truth Tables *Chapter 3 Review Test 2 | pp.130-133:3,5,7,9,13,15,17,19,21,23,29,35,39,41,45,49 |
| 3 | 07/15 | Section 4.1 Numeration Systems Section 4.2 Historical Numeration Systems Section 4.3 the Hindu-Arabic System | pp.144-145:3,9,11,15,17,19,23,25,29,31,35,39,43,47,53,55,61 pp.150-151:1,3,5,9,13,19,21,25,31,35,39,41,43,45 pp.157-158:1,3,5,11,13,15,17,21,25,47,31,35,39,41,45,49 |
| 4 | 07/20 | Section 4.4 Conversion Between Number Bases Test 3 | pp.165-167:1,5,7,9,13,15,19,21,33,39,41,43,49,51,53,57,59,63,69,73,83,65,89 |
| 4 | 07/22 | Section 9.1 Points, Lines, Planes Section 9.2 Curves, Polygons | pp.455-457:1,5,7,21,23,25,27,33,41,43,47,49,55,57,59,61,63,65,66,70,75 pp.462-464:1,7,9,15,17,21,23,27,29,33,35,41,43,44,45,47 |

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| | | and Circles Section 9.3 The Geometry of Triangles | pp.473-476: 3,7,13,17,19,23,25,29,33,35,37,39,41,45,47,51,53,59,65,71,73,77,79,83 |
| 5 | 07/27 | Section 9.4 Perimeter, Area, and Circumference Section 9.5 Volume and Surface Area Test 4 | pp.484-488: 1,5,7,11,15,17,19,21,23,27,33,37,43,47,49,55,60,61,62,65,67,68,69,85,89 pp.493-496:1,7,11,13,15,17,19,25,27,31,35,41,45,47,51 |
| 5 | 07/29 | Section 9.6 Transformational Geometry Section 9.7 Non-Euclidean Geometry, Topology | pp.504-505:1,4,5,9,11,13,17,22,25,29,37,39,41,43 pp.512-515:1,3,11,13,17,19,23,27,29,33,35,37,39,41 |
| 6 | 08/03 | Review | |
| 6 | 08/05 | Final Exam | 12:30 PM – 3:00 PM |