

Syllabus

Instructor: Dr. Alexander Krantsberg

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Office: Bisdorf, Room AA 352

Class Time: Tuesdays, Thursdays 2:00 PM - 3:15 PM.

Classroom: Bisdorf, AA 355

Office hours: Mondays and Wednesdays 11:00 AM -12:00PM, 2:30 PM: 4:30 PM
and Thursdays 1:00 PM –2:00 PM, 3:30 PM - 4:30 PM

Important Dates

August 22

September 5

September 8

November 1

November 24-25

December 15

Classes begin

Labor Day holiday. College closed

Last day to drop a class with a tuition refund

Last day to withdraw without grade penalty

Thanksgiving holiday. College closed

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

Syllabus

- distinguish between Euclidean geometry, non-Euclidean geometry
- apply topological concepts
- 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. Personal Financial Mathematics

G. Optional topics

1. Sequences and Series
2. Chaos

Syllabus

3. Fractals
4. Consumer mathematics
5. Metric system
6. Number Theory

Textbook

Mathematical Ideas: 3rd Custom Edition for Northern Virginia Community College, by C. Miller, V. Heeren, J. Hornsby, and C. Heeren) (most sections taken from Mathematical Ideas, 13th edition by the same authors). This book also can be used for MTH 152. If you do not need MTH152, then you can use older editions.

You have several options:

1. **NOVA Special Bundle** for Liberal Arts I by Miller (with access to the online software MyMathLab) - ISBN: 9781323145609.
2. **Mathematical Ideas**, ISBN: 9780321977076.
3. **MyMathLab** Access Code with e-textbook.

MyMathLab

MyMathLab is a valuable tool for study and review, although it is not required for this course. There will be an extra credit of 10% for each homework assignment completed online by using MyMathLab. If you purchased access to MyMathLab, you can access it at www.CourseCompass.com The course ID is krantsberg55106

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 - 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 September 8, 2016.** **The last day to withdraw without grade penalty is November 1, 2016.** You are responsible for doing all paperwork before these last dates.

Syllabus

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 September 15**
- Test 2 October 18**
- Test 3 November 8**
- Test 4 November 29**

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 **Thursday, December 15, 2016 from 3:30 PM to 5:10 PM.**

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.

Contingency plans for canceled classes will be posted on Blackboard.

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

Northern Virginia Community College
MTH 151-005A (11796) **Math for the Liberal Arts I (3 CR.)** **Fall 2016**
Syllabus

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	08/23	Section 2.1-Basic Concepts	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
1	08/25	Section 2.2 Venn Diagrams and Subsets Section 2.3 Set Operations	1,7,11,13,15,19,21,23,25,30,33,35,39,41,43,45,47,51,53,57,59,62,63 1,3,7,11,13,19,23,27,28,29,30,33,35,39,41,46,47,49,51,54,57,65,67,73,77,79,83,85,90
2	08/30	Section 2.4 Surveys and Cardinal Numbers	1,3,5,11,17,18,19,21,23,27,31
2	09/01	Section 3.1 Statements and Quantifiers	1,3,7,11,13,19,23,27,28,29,30,33,35,39,41,46,47,49,51,54,57,65
3	09/06	Section 3.2 Truth Tables	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
3	09/08	Section 3.3 The Conditional	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
4	09/13	Section 3.4 The Conditional and Related Statements	7,9,11,13,15,25,29,31,33,35,41,45,47,51,53,55,57
4	09/15	Test 1	
5	9/20	Section 3.5 Analyzing Arguments	3,5,9,11,15,17,23,25,27
5	09/22	Section 3.6 Analyzing Arguments with Truth Tables	3,5,7,9,13,15,17,19,21,23,29,35,39,41,45,49
6	09/27	*Chapter 3 Review	
6	09/29	Section 4.1 Numeration Systems Section 4.2 Historical Numeration Systems	3,9,11,15,17,19,23,25,29,31,35,39,43,47,53,55,61 1,3,5,9,13,19,21,25,31,35,39,41,43,45
7	10/04	Section 4.3 the Hindu-Arabic System	1,3,5,11,13,15,17,21,25,47,31,35,39,41,45,49

Syllabus

7	10/06	Section 4.4 Conversion Between Number Bases	167:1,5,7,9,13,15,19,21,33,39,41,43,49,51,53,57,59,63,69,73,83,65,89
8	10/11		Professional development for faculty. No Classes
8	10/13	Review	
9	10/18	Test 2	
9	10/20	Section 9.1 Points, Lines, Planes	1,5,7,21,23,25,27,33,41,43,47,49,55,57,59,61,63,65,66,70,75
10	10/25	Section 9.2 Curves, Polygons and Circles	1,7,9,15,17,21,23,27,29,33,35,41,43,44,45,47
10	10/27	Section 9.3 The Geometry of Triangles	3,7,13,17,19,23,25,29,33,35,37,39,41,45,47,51,53,59,65,71,73,77,79,83
11	11/01	Section 9.4 Perimeter, Area, and Circumference	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
11	11/03	Section 9.5 Volume and Surface Area	1,7,11,13,15,17,19,25,27,31,35,41,45,47,51
12	11/08	Test 3	
12	11/10	Section 9.7 Non-Euclidean Geometry, Topology	1,3,11,13,17,19,23,27,29,33,35,37,39,41
13	11/15	13.1 The time Value of Money 13.2 Consumer Credit	3,5,8,9,11,14,23,25,29,33,37,41,50, 55, 61 3,5,6,7,9,10,15,17, 20,23,27,33,39, 41
13	11/17	13.3 Lending 13.4	1,7,9,15,19,23,25,29,33,35 3,7,11,17,25,35,45,47
14	11/22	13.5 Investments	3,6,9,13,17,21,29,35,38,43,47,51,59,65
14	11/24		Thanksgiving holiday. College closed.
15	11/29	Test 4	
15	12/01	14.1 Graphs 14.2 Circuits	1,4,9,12,15,17,20,22,23,25,29,31,35,41,43,47,58,65 1,5,9,13,17,31,25,27,31,33,39,
16	12/06	14.3 Hamilton Circuits	1,4,7,11,15,19,23,38,41,49
16	12/08	Review	
17	12/13	Review	
17	12/15	Final Exam	3:30 PM – 5:10 PM