

Northern Virginia Community College  
**MTH 151-006A** (24333)      **Math for the Liberal Arts I (3 CR.)**      **Spring 2018**  
**Syllabus**

**Instructor:** Dr. Alexander Krantsberg  
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**Phone:** 703-845-6548  
**Office:** Bisdorf, Room AA 352

**Class Time:** Tuesdays, Thursdays 12:30 PM - 1:45 PM.  
**Classroom:** Bisdorf, AA 456

**Office hours:** Monday      11:00 AM-12:00 PM, 3:00 PM-5:00 PM  
    Tuesday      11:00 AM-12:00 PM, 2:00 PM-3:00 PM (MML)  
    Wednesday 11:00 AM-12:00 PM, 3:00 PM-5:00 PM  
    Thursday    11:00 AM-12:00 PM, 2:00 PM-3:00 PM (MML)

**Important Dates**

<b>Classes begin</b>	<b>January 10</b>
Drop a class on NOVAConnect with tuition refund	January 10 – January 29
Martin Luther King, Jr. Holiday. College offices closed.	January 15
Last day to drop a class with a tuition refund or change to audit	January 29
Spring Break	March 12-18
Last day to withdraw without grade penalty	March 22
Final exam week	May 2-8
Final Exam	May 8
Final exams end	May 8

**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**

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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
- 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

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

## Textbook

Mathematical Ideas: 3<sup>rd</sup> Custom Edition for Northern Virginia Community College, by C. Miller, V. Heeren, J. Hornsby, and C. Heeren) (most sections taken from Mathematical Ideas, 13<sup>th</sup> 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](http://www.CourseCompass.com) The course ID is **krantsberg72928**

## 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:

## Syllabus

- 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 January 29, 2018.** **The last day to withdraw without grade penalty is March 22, 2018.** You are responsible for doing all paperwork before these last dates.

### 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    February 6**
- Test 2    March 8**
- Test 3    March 29**
- Test 4    April 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 **Tuesday, May 8, 2018 from 1:30 PM to 3:10 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.

### Course Policies

- **Classroom Behavior**

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

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- **Late Assignment Policy**  
Penalty of 20 % is imposed for every two weeks after the assignment due date.
- **Exams and Make-Up Exams**  
You may make up a test within two weeks after the test. It is your responsibility to schedule the make-up test with me.
- **Cellphones, Smartphones, Laptops and Other Electronic Devices**  
You should silence all electronic devices. No texting during class time. You are not allowed to use any electronic device, except a graphing calculator during in-class assessments.
- **Student Professionalism**  
All students are considered adults and will conduct themselves in a professional manner at all times. Please read the section titled Student Conduct, Rights, and Responsibilities: B. Student Conduct in the [Student Handbook](#).

### Student Support Resources

- **IT Helpdesk The IT**  
Help Desk provides first-level technical support to all faculty, staff and students of Northern Virginia Community College. Additional details and resources are located at <http://www.nvcc.edu/ithd/>.  
HOURS OF OPERATION

The Help Desk offers assistance 24 hours a day, 7 days a week.  
Service is available nights, weekends and holidays.

**Phone:** 703.426.4141

**Alexandria IT** 703.845.6226

**Email:** [ithelpdesk@nvcc.edu](mailto:ithelpdesk@nvcc.edu)

- **Disabilit**

#### y Services for Students:

The College is committed to the goal of providing each qualified student an equal opportunity to pursue a college education regardless of disability. Efforts will be made toward meeting reasonable requests for services to students with disabilities eligible under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA). Please read the section titled Disability Services for Students in the Student Handbook.

Students requiring special needs in accordance with the American's With Disabilities Act must provide to the professor the NOVA Accommodation Form. Every effort will be made to meet student's special needs when the student makes those needs known appropriately. It is the student's responsibility, not a counselor's, to present the NOVA Accommodation Form to the professor. Accommodations will begin as soon as the form is received and are not retroactive. Please visit the Disability Support Service (DSS), Disability Documentation Guidelines, and Disability Services Intake Packet NOVA website pages for additional details and list of Disability Counselors by Campus.

Northern Virginia Community College, Disability Services <http://www.nvcc.edu/current-students/disabilityservices/>

- **Tutoring**  
Tutoring is available in my office during my office hours or by appointment.

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- **Emergencies**

Anyone observing an emergency situation should contact the Campus Police Office or the dean of students.

**Alexandria Police Office**

Bisdorf Building, Room 240 Phone: 703.764.5000 Email: PoliceDispatch@nvcc.edu

Hours: 24 hours a day, 7 days a week

**Dean of Students**

Bisdorf Building, Room 195 Phone: 703.845.6219 Email: vdiaz@nvcc.edu

- **Classroom Emergency Response Procedures**

All classrooms have an evacuation plan and directions (showing the route to the nearest building exit) posted next to the light switch by the doorway of each room. When the fire alarm sounds, immediately leave the classroom or lab with all of your belongings in accordance with the Evacuation Plan. Do not take the elevator. Do not activate cell phones or radios and please help assist the disabled.

- **Inclement Weather Policy**

If the college is closed, a text alert will be sent to cell phones registered on NOVA Alert and a notice will be posted on the College's website [www.nvcc.edu/emergency](http://www.nvcc.edu/emergency). You may find out whether the college is closed by checking the web site, the TV or radio news, or by signing up for text message announcements. Please visit <http://www.nvcc.edu> for detailed information.

Individuals may also call the College Call Center at 703-323-3000 or NOVAConnect Phone at 703-323-3770. Do not call individual offices.

If weather conditions cause the College to close, all NOVA campuses and off-campus locations are closed.

In all cases of delayed openings, classes that would have started prior to an opening time and continued at least 45 minutes after the opening time will go on at the opening time. For example, in the case of a two-hour delay, a two-hour class that normally begins at 9:00 a.m. and continues to 11:00 a.m. would start at 10 a.m. and continue as usual until 12:00 p.m.

- **Emergency Procedures for Class Continuance**

In the event of a College-wide emergency, course requirements, classes, deadlines, and grading schemes are subject to changes that may include alternate delivery methods, alternate methods of interaction with the instructor, class materials, and/or classmates, a revised attendance policy, and a revised semester calendar and/or grading scheme. In case of a College-wide emergency, please refer to the following about changes in this course:

Website: Blackboard (through learn.vccs.edu or MyNOVA) For general information about an emergency situation, please refer to: <http://www.nvcc.edu> or 703-450-2540 Nova Emergency Alert Registration: <https://alert.nvcc.edu> In event of an emergency just regarding this class, check Blackboard for announcements regarding course progress/assignments.

**Note: The syllabus is subject to change.**

### Course Outline

(Subject to change at any time)

Week	Date	Section	Assignment (due the following week)
1	01/11	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

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1	01/16	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	01/18	Section 2.4 Surveys and Cardinal Numbers	1,3,5,11,17,18,19,21,23,27,31
2	01/23	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	01/25	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	01/30	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	02/01	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	<b>02/06</b>	<b>Test 1</b>	
5	02/08	Section 3.5 Analyzing Arguments	3,5,9,11,15,17,23,25,27
5	02/13	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	02/15	*Chapter 3 Review	
6	02/20	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	02/22	Section 4.3 the Hindu-Arabic System	1,3,5,11,13,15,17,21,25,47,31,35,39,41,45,49
7	02/27	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	03/01	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
8	03/06	Section 9.2 Curves, Polygons and Circles	1,7,9,15,17,21,23,27,29,33,35,41,43,44,45,47
9	<b>03/08</b>	<b>Test 2</b>	
9	<b>03/13</b>		<b>Spring Break</b>
10	<b>03/15</b>		<b>Spring Break</b>
10	03/20	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	03/22	Section 9.4 Perimeter, Area, and	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

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		Circumference	
<b>11</b>	03/27	Section 9.5 Volume and Surface Area	1,7,11,13,15,17,19,25,27,31,35,41,45,47,51
12	<b>03/29</b>	<b>Test 3</b>	
12	04/03	Section 9.7 Non-Euclidean Geometry, Topology	1,3,11,13,17,19,23,27,29,33,35,37,39,41
13	04/05	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	04/10	13.3 Lending 13.4	1,7,9,15,19,23,25,29,33,35 3,7,11,17,25,35,45,47
14	04/12	13.5 Investments	3,6,9,13,17,21,29,35,38,43,47,51,59,65
14	<b>04/17</b>	<b>Test 4</b>	
15	04/19	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,
<b>15</b>	04/24	14.3 Hamilton Circuits	1,4,7,11,15,19,23,38,41,49
16	<b>04/26</b>	Review	
16	<b>05/01</b>	Review	
17	<b>05/03</b>		
<b>17</b>	<b>05/8</b>	<b>Final Exam</b>	<b>1:30 PM – 3:10 PM</b>