

Northern Virginia Community College
MTH 174-101A (20331) CALCULUS with Analytic Geometry II (5 CR.) **Fall 2017**
Syllabus

Instructor: Dr. Alexander Krantsberg
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Office: Bisdorf, Room AA 352

Class Time: Tuesdays, Thursdays 5:00 PM - 7:15 PM.
Classroom: Bisdorf, AA 456

Office hours: Monday 1:00 PM-2:00 PM, 6:00 PM-7:00 PM
 Tuesday 3:00 PM-5:00 PM, 7:30 PM-8:30 PM
 Wednesday 1:00 PM-2:00 PM, 6:00 PM-7:00 PM
 Thursday 3:00 PM-5:00 PM, 7:30 PM-8:30 PM

Important Dates

Classes begin	August 21
Drop a class on NOVAConnect with tuition refund	August 21-September 7
Labor Day holiday. College closed.	September 4
Last day to drop a class with a tuition refund or change to audit	September 7
Professional development days for faculty. No classes for students.	October 9-10
Last day to withdraw without grade penalty	October 31
No classes. College offices close at noon	November 22
Thanksgiving holiday. College closed.	November 23-24
No classes. College offices closed.	November 25-26
Final exam week	December 11-17
Final Exam	December 14
Final exams end	December 17

Course Content

(visit <http://www.nvcc.edu/academic/coursecont/summaries/MTH174.pdf> for details)

Course Description

MTH 174– Calculus II continues the study of analytic geometry and the calculus of algebraic and transcendental functions, introduces polar and parametric graphing, indefinite and definite integrals and method of integration, vectors, and power series including applications.

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Course Purpose

This course is primarily for students in mathematics, engineering sciences, and in other areas requiring strong mathematical background. The course will give you a basic understanding of the concepts of integral calculus, power series and vectors and to prepare you for multivariable calculus.

Prerequisites

Satisfactory completion of MTH 173 – Calculus with Analytic Geometry I or equivalent.

Course Objectives

After completion this course, you should be able to:

- Solve problems involving volume, arc length work and centroids of plane areas
- Differentiate and integrate expressions involving transcendental functions
- Define conics, vectors, sequence, limit of a sequence, infinite series, convergence and divergence of a series
- Solve problems involving conics, rotation and translation of coordinate axes and polar coordinates
- Find areas bounded by curves in polar form
- Solve problems involving parametric equations, vectors
- Solve problems involving improper integrals and infinite limits of integration
- Find series representations of functions and use Taylor's theorem with remainder
- Differentiate and integrate power series, solve problems in indeterminate forms
- Obtain competency in the use of a graphing utility in the covered topics.

Major Topics

- A. Applications of integrals (volume, arc length, work, centroids of plane regions)
- B. Transcendental functions and their integration (inverse trigonometric, hyperbolic, and inverse hyperbolic)
- C. Methods of integration (substitution, integration by parts)
- D. Conics
- E. Polar coordinates
- F. Parametric Equations and Vectors (including differentiation and integration of parametric functions)
- G. Indeterminate forms (L'Hopital's Rule)
- H. Improper Integrals (comparison test for convergence)
- I. Infinite series (convergence tests, power series, Maclaurin and Taylor series)
- J. Using technology to solve problems in calculus

Textbook

Calculus: Early Transcendental Functions, 6th Edition, by Ron Larson and Bruce Edwards; ISBN: 978-1-285-77477-0

This textbook is also used in Calculus II MTH 173 and Vector Calculus MTH 277 .

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There are several options for you to choose.

1. Rent a used or new textbook
2. Buy a used or new textbook
3. Buy a textbook with WebAssign Access Code
4. Buy a WebAssign Access code with an online version of the textbook (eBook).

WebAssign

WebAssign is a valuable tool for study and review, but it is not required. There will be an extra credit of 10% for homework completed online by using [WebAssign](#).

If you purchased access to WebAssign, the class key is **nvcc 2159 4192**.

(Solutions to odd-numbered numbers problems in the textbook can be found on <http://www.calcchat.com> }

Alternative Textbook

The textbook is Calculus Volume 1 by Gilbert Strang, Edwin Herman., et al. This is an OpenStax resource that can be found at <https://openstax.org/details/calculus-volume-1>.

I highly recommend to use this textbook in conjunction with [WebAssign](#).

If you want to purchase access to WebAssign, you need the Class Key: (I will provide it.)

The price of WebAssign instant Access for OpenStax Calculus for one semester is \$33.95

The price of WebAssign instant Access for OpenStax Calculus for multiple semester is \$51.90

Calculator

This course requires a graphing device TI-83 or better; TI-89 is strongly recommended.

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 7, 2017.** **The last day to withdraw without grade penalty October 31, 2017.** 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

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lowest grade on homework, quizzes, or tests 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 class. Do not forget to put your name, the text book section, pages and problem numbers.

Quizzes: We will have quizzes on most weeks 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 14**
- Test 2 October 17**
- Test 3 November 14**
- Test 4 December 5**

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 14, 2017 from 5:30 PM to 7:10PM.**
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.
- **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**

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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

- **Disability 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.

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

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- **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. 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> 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 on Monday)
1	08/22	Review: Chapter 2, 3, 5	p.88: 55,58, 65, 70, 85,94 p.160: 45,48,60,70,76,78,106 pp.287-289:10,19,24,25 pp.309: 4,12
1	08/24	Section 5.5- Integration by Substitution	pp.337-339: 2,6,12,19,28,35,36,40,48,52,60,64,69,74,79,91,105
2	08/29	Section 5.6 – Numerical Integration Section 5.7- The Natural Logarithmic Function: Integration	pp.346-347:6,16,32 pp.354-356:4,6,8,11,13,19,22,24,29,32,37,42,44,58,68
2	08/31	Section 5.8 – Inverse Trigonometric Functions: Integration Section 5.9 – Hyperbolic	pp.362-364:1,4,5,9,11,15,23,25,28,36,37,39,42,46,63,70,72 pp372-373: 3,15,18,23,28,43, 46,56,59,60

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		Functions	
3	09/05	Section 7.1 Area Between Two Curves Section 7.2 -Volume: The Disk Method	pp.442-443:2,4,6,8,16,17,28,38,43 pp.453-455:1,4,5,8,11,13,18,29,41,71
3	09/07	Section 7.3 -Volume:The Shell Method Section 7.4 - Arc Length and Surfaces of Revolution	pp.462-464:2,9,17,22,24,29,47 pp.473-475:3,7,9,23,38,43,57
4	09/12	Section 7.5 - Work Section 7.6 -Moments Section 7.7 –Fluid Pressure	pp.483-487:2,5,12,17 pp.494--496:1,9,15,18,25,38,48 pp. 501-502:1,6,8,18,28
4	09/14	Test 1	
5	9/19	Section 8.1 - Basic Integration Rules Section 8.2 -Integration by Parts	pp. 512-514:2,5, 7,11,19,23,29,38,43,46,57,61,64 pp.521-523:2,4,10,12,15,18,21,27,34,42,44,48,55
5	09/21	Section 8.3 -Trigonometric Integrals Section 8.4 -Trigonometric Substitution	pp.530-532:1,8,10,16,23,24,28,36,61,64 pp.539-541:1,4,7,10,16,23,27,31,38,41,45,55,67
6	09/20	Section 8.5 - Partial Fractions	pp.549-550:1,5,9,11,17,20,25,27,30,31,43
6	09/28	Section 8.6 -Integration Techniques	pp.555-556:1,3,7,9,15,17,19,23,28,31,34,36
7	10/03	Section 8.6 -Integration Techniques Section 8.7 -Indeterminate Forms	pp.555-556:1,3,7,9,15,17,19,23,28,31,34,36 pp.564-567:2,5,8,13,14,21,28,32,34,36,40,45,50,56,57
7	10/05	Section 8.7 -Indeterminate Forms	pp.564-567:2,5,8,13,14,21,28,32,34,36,40,45,50,56,57
8	10/10	No Classes	Professional development for faculty.
8	10/12	Section 8.8 -Improper Integrals	pp.575-578:2,4,7,10,12,17,19,20,22,24,28,31,34,37,42,47,56,61,71
9	10/17	Test 2	
9	10/19	Section 9.1 -Sequences	pp.592-594: 2,6,8,10,19,29,34,38,39,41,44,49,52,55,61,75
10	10/24	Section 9.2 -Series Section 9.3 -The Integral Test	pp.601-603:2,6,21,23,26,30,32,36,49,53,62 pp.609-612:2,3,8,9,15,19,29,31,36,47,49
10	10/26	Section 9.4 -Comparison of Series Section 9.5 -Alternating Series	pp.616-618:5,6,9,12,14,15,18,22,26,28,30, pp.625-627:5,8,9,10,18,26,31,39,46,50,63,71,74
11	10/30	Section 9.6 -The Ratio and Root Tests Section 9.7 -Taylor Polynomials	pp.633-635:5,12,14,16,20,26,28,33,42,49,54,58,64 pp.644-646:2,4,8,14,17,26,30,46,49,58
11	11/02	Section 9.8 -Power Series Section 9.9 -Power Series	pp. 668-670:1,4,5,8,11,16,17,21,46,78

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		Representation of Functions	pp.662-663:2,4,6,13,20,26,35,54
12	11/07	Test 3	
12	11/09	Section 9.10 -Taylor and Maclaurin Series	pp.673-675:2,3,7,17,24,27,33,39,44,47,51,64,72
13	11/14	Section 10.1 -Conics	pp.692-696:9,7,10,18,26,30,40,44,53
13	11/16	Section 10.2 - Plane Curves Section 10.3 -Parametric Equations	pp. 703-705: 1,3,7,13,17,25,38,45,79 pp.711-714:2,12,16,24,27,40,57
14	11/21	Section 10.4 -Polar Coordinates Section 10.5 -Area and Arc Length	pp.722-724:1,5,9,15,26,38,47 pp.731-733:2,11,22,78
14	11/23		Thanks giving holiday. College closed.
15	11/28	Section 10.6 -Polar Equations of Conics Section 11.1 -Vectors in the Plane	pp.739-741:1,8,13,15,16,19,20,22,24,35,37,39,41,57,67 pp.755-758:1,7,12,17,25,28,34,38,40,46,54
15	11/30	Section 11.2 -Space Coordinates and Vectors in Space 11.3 -The Dot Product of Two Vectors	pp.763-765:4,6,14,24,42,45,70 pp.773-775:5,11,14,26,29,37
16	12/05	Test 4	
16	12/07	Review	
17	12/12	Review	
17	12/14	Final Exam	<u>5:30 PM to 7:10PM</u>