MTH 174-101A (38140)   **CALCULUS with Analytic Geometry II (5 CR.)**   **Fall 2016**
Syllabus

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Office: Bisdorf, Room AA 352

Class Time: Tuesdays, Thursdays 4:30 PM - 6:45 PM.
Classroom: Bisdorf, AA 456

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

Important Dates

August 22	**Classes begin**
September 5	**Labor Day holiday. College closed**
September 8	**Last day to drop a class with a tuition refund**
November 1	**Last day to withdraw without grade penalty**
November 24-25	**Thanksgiving holiday. College closed**
December 15	**Final Exam**

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.

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, 6$^{\text{th}}$ 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 .

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 6455 9120** .
Solutions to odd-numbered numbers problems in the textbook can be found on
http://www.calcchat.com

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

Syllabus

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 <u>before</u> 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 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 15**
  Test 2   **October 18**
  Test 3   **November 15**
  Test 4   **December 6**

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 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.

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 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 on Monday)
1	08/23	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	08/25	**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	08/30	**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	09/01	**Section 5.8** – Inverse Trigonometric Functions: Integration **Section 5.9** – Hyperbolic Functions	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

3	**09/06**	**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	09/08	**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	09/13	**Section7.5**- 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	**09/15**	## Test 1	
5	9/20	**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	09/22	**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	09/27	**Section 8.5**- Partial Fractions	pp.549-550:1,5,9,11,17,20,25,27,30,31,43
6	09/29	**Section 8.6**-Integration Techniques	pp.555-556:1,3,7,9,15,17,19,23,28,31,34,36
7	10/04	**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	10/06	**Section 8.7**-Indeterminate Forms	pp.564-567:2,5,8,13,14,21,28,32,34,36,40,45,50,56,57
8	**10/11**		## Professional development for faculty. No Classes
8	10/13	**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	10/18	## Test 2	
9	10/20	**Section 9.1**-Sequences	pp.592-594: 2,6,8,10,19,29,34,38,39,41,44,49,52,55,61,75
10	**10/25**	**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	10/27	**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	11/01	**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	11/03	**Section 9.8**-Power Series **Section 9.9**-Power Series Representation of Functions	pp. 668-670:1,4,5,8,11,16,17,21,46,78 pp.662-663:2,4,6,13,20,26,35,54

12	**11/08**	**Test 3**	
12	11/10	**Section 9.10**-Taylor and Maclaurin Series	pp.673-675:2,3,7,17,24,27,33,39,44,47,51,64,72
13	11/15	**Section 10.1**-Conics	pp.692-696:9,7,10,18,26,30,40,44,53
13	11/17	**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	11/22	**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	**11/24**		**Thanksgiving holiday. College closed.**
15	11/29	**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	12/01	**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	**12/06**	**Test 4**	
16	12/08	Review	
17	12/13	Review	
17	12/15	**Final Exam**	**5:30 PM to 7:10PM**