Gateway STEM High School/University of Missouri – St. Louis

MATH 1800, ANALYTIC GEOMETRY AND CALCULUS I
SYLLABUS

COURSE TITLE: Analytic Geometry and Calculus 1/(UMSL Math 1800 , Gateway STEMAP Calculus AB)
CREDIT: 5 credit hours
DATE: Fall 2022 – Spring 2023

INSTRUCTOR: Mr. Jasmin Cerić, MEd.
Room: 201 South
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TEXT: We will use multiple texts in this course

- Calculus by Edwards 7th edition (class set for in class exercises, homework and examples)
- *Calculus* by James Stewart 6th edition.
- Calculus online textbook from MIT. (enrichment) https://ocw.mit.edu/ans7870/resources/Strang/Edited/Calculus/Calculus.pdf

SOFTWARE: MyMathLab

COURSE DESCRIPTION: This course provides an introduction to differential and integral calculus. Topics include limits, derivatives, related rates, Newton's method, the Mean-Value Theorem, Max-Min problems, the integral, the Fundamental Theorem of Integral Calculus, areas, volumes, and average values..

PREREQUISITES: The course prerequisites are:

- At least B in Honors Algebra II and Trigonometry/Precalculus
  OR
  At least B in Honors Algebra II and concurrent enrollment in Precalculus or College Algebra class
- 11th or 12th grade standing at Gateway STEM High School with an overall 3.0 or higher GPA. 11th or 12th graders with an overall GPA of 2.5 – 2.99 must provide a recommendation letter from their principal OR school counselor AND their parent or legal guardian.
- The following academic requirements must also be met:
  - Math/ACT score of 22 **OR**

- Math/ACT score of 21 with 3.0 GPA and completion of Algebra I, Algebra II with at least a B.
- Math/ACT score of 20 with 3.0 GPA and completion of Algebra I, Algebra II with at least an A.

ACP ENROLLMENT: In order to receive Math 1800 credit through UMSL, each student will need to enroll through the ACP website found at http://umsl.edu/acp. We will do this as a class before the due date of **September 12th**.
To obtain 3 hours of credit through UMSL, you must pass this course with a "C" or above and can only receive those credits **if** you enroll online.
DISCLAIMER: This course is TOUGH. By signing up for this course, the student acknowledges that in order to obtain college credit, they will have to perform at college level. This includes having appropriate classroom behavior, completion of ALL homework assignments, and having a positive attitude about their classmates and their own learning.

NO CALCULATORS ALLOWED FOR QUIZZES AND EXAMS!
The reason for this is that we have found that the use of such devices tends to exacerbate student weaknesses, particularly regarding basic skills. For that reason, you might consider not using one on your homework unless it's an absolute must.

TECHNOLOGY: This course uses a variety of technologies including many of the assignments being online only. It is imperative that if you are taking this course, that you have access to some sort of computer system which will allow you to gain online access. Throughout the course, we will make trips to the computer labs to give you time to work on assignments, but this will not be enough time for you to necessarily complete all of your assignments.

TOPICS:

Topics in Sequence of Discussions:	**Approximate # of weeks**
Limits, delta-epsilon definition, limit theorems, limits of trigonometric functions	4 weeks
Continuous and discontinuous functions, Intermediate value theorem.	2 weeks
Differentiation, basic theorems and formulas, derivatives of trigonometric functions, chain rule and implicit differentiation, slopes of tangent lines	6 weeks
Related rate problems, linear approximations and differentials	4 weeks
Extreme value theorem, mean value theorem, theory of maxima and minima and concavity, with examples	4 weeks
Limits at infinity and asymptotes, graphing functions	4 weeks

using methods of calculus	
Optimization problems and Newton's method of approximation	4 weeks
Anti-derivatives and Riemann sums. Definition of the Riemann integral and Fundamental Theorem of Calculus	2 weeks
Evaluating definite and indefinite integrals, method of substitution	4 weeks
Applications of the method of Riemann sums to finding areas between curves, finding volumes of solids including solids of revolution, work done by a force, average values of functions	2 weeks

OBJECTIVES:

Upon completion of Math 1800, the student should be able to

- ✓ Understand the theory of limits, continuity, differentiation
- ✓ Become proficient in using the techniques of differentiation
- ✓ Obtain the ability to apply differentiation to solve related rates and optimization problems
- ✓ Understand the concept of a Riemann integral and the use of the Fundamental Theorem of Calculus to calculate Riemann integrals
- ✓ Use of the method of Riemann sums to find areas, volumes and other geometric and physical quantities
- ✓ Develop a proper writing style for solutions of mathematical problems

CLASSROOM EXPECTATIONS/POLICIES:

The students in room 201 South are expected to:

1. *Respect the materials around you*. Show respect for the material we are learning, the materials available in class, and any material that comes into room 201 South. To show respect, use thoughtful and academic language, and contribute to discussions in a meaningful manner. Any disrespectful language or behavior will **NOT** be tolerated.
2. *Be ready to start when the bell rings*. This means being in your seat when the bell rings and remain in your seat unless excused by the teacher. All materials are to be gathered and ready to be used when the bell rings at the start of class. The restroom and water fountain are to be used during breaks.
3. *Remain on task throughout the entire class time*. Class time is from bell to bell. Students are expected to begin working when the initial class bell rings and will end work when the dismissal bell rings. Each class will be dismissed by the teacher.
4. *Food and Drinks are to be enjoyed during passing period and at lunch*. Food and drink are not to be consumed in the classroom during class time.

HOMEWORK: Students will receive homework assignment sheet with suggested homework problems. These suggested problems will not be turned in; however working the suggested homework problems is the best preparation for quizzes and tests. These problems all have answers in the back of the book. Doing lots of problems will give you the knowledge and skills

to do well on the tests and quizzes. You are expected to spend at least two hours outside of class for each hour of class time; this means a minimum of two and a half hours daily!
Quiz questions will be usually consist of 5 problems selected directly from your homework assignments.

QUIZZES
There will be 11 class quizzes and 4 take-home quizzes. Class quizzes are closed-textbook/notes; calculators are not allowed; they will cover the same material as homework problems. Answers with no work will not be given any points; only fully worked out solutions will be given partial/full credit. The lowest score for class quizzes will be dropped; no score for the take-home quizzes will be dropped. There will be NO make-up for quizzes.

EXAM POLICY: There will be 4 tests and the mandatory comprehensive Final Exam. Dates of the exams are shown in the schedule. All exams are closed books/notes, and calculators are NOT allowed. There will be NO tests dropped. Failure to appear for an exam will result in a grade 0 for that exam unless prior arrangements have been made. You will be allowed to take an exam at a different time (at the Campus Testing Center) ONLY in case of a serious trouble verified by some document (a doctors excuse, a copy of a police report, a letter from a supervisor etc.).

WARNING: You must pay close attention to the due dates of your assignments. It is YOUR responsibility to get your work done on time.

MASTERY EXAM: A mastery exam will be given before the second test (see the schedule). This exam will consist of very basic but essential differentiation problems. Of the 8 problems on the exam, you MUST do 7 ABSOLUTELY correctly. The exam can be retaken until "mastery" (the minimum skill level in differentiation) is achieved. You cannot get a grade of C or better in Math 1800 unless you pass the mastery test by March 25 (regardless of your performance otherwise). The Mastery Test is NOT included into the grading scheme.

LATE WORK POLICY: Late work will be accepted throughout this course. However, late work will only be accepted up to the unit test for each unit and at a maximum of 50% of the value of the assignment. Do your homework completely and on time and you won't even have to think about this.

ACADEMIC DISHONESTY: Plagiarism is defined as presenting as one's own the words, the work, or the opinions of someone else without proper acknowledgment. Students at Gateway STEM High School are expected to complete their own work, just as they would have to in the post-secondary and professional environment. Plagiarism will result in a zero on the assignment and a referral.

DATES TO REMEMBER:

Last Day to Drop (Semester 1): December 1st , 2022
Last Day to Drop (Semester 2): April 1st , 2023

GRADE ASSIGNMENT: Grades will be determined on the following scale:
100-90 A, 89.9-80 B, 79.9-70 C, 69.9-60 D, Below 60 F

Assignment	Percentage of Grade
Attendance/Class Participation/Quizzes	16%
Take home quizzes	4%
Exams	50%
Final	30%

Final grades will be determined by averaging out the semester 1 and semester 2 grades.

DC Calculus and Analytic Geometry/MATH 1800

Course Syllabus Acknowledgement Form

Student and Parent/Legal Guardian Acknowledgement:

I have been provided with access to the course syllabus, understand what is expected of me, fully understand the course expectations and grading outline, and agree with the provision set forth in the syllabus.

This course is offered for dual credit through UMSL if your student registers online.

☐ Check this box if you have read and understand that this course is offered for college credit and that your student must register online to receive that credit.

_____	_____
Student Printed Name	Date
_____	_____
Student Signature	Email Address
_____	_____
Parent Printed Name	Date
_____	_____
Parent Signature	Email Address