# AP CALCULUS BC

Teacher Name: Teresa Tarter Teacher E-mail: tgtarter@madisoncity.k12.al.us

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| ***Course Description:*** | Advanced Placement (AP) Calculus BC is a continuation of Calculus A. The primary focus of the course is preparing students for the AP Calculus BC exam. Topics covered include transcendental functions, techniques of integration, applications of integration, and infinite series. Also, the material from Calculus PreAP will be reviewed extensively in preparation for the BC exam. Students are encouraged (but not required) to take the AP Calculus BC exam. College credit at most universities may be earned for Calculus I and Calculus II by scoring a 3, 4, or 5 on the AP Calculus BC exam. Calculus A should be taken in the fall of the school year that a student is taking AP Calculus BC. |
| ***Course Objectives:*** | This course continues the study of differential and integral calculus that was begun in Calculus PreAP. The primary aims of the course are to help students develop new problem solving and critical reasoning skills and to prepare them for further study in mathematics, the physical sciences, or engineering. By the end of the course, students should be able to<br>• apply integration to several types of physical problems;<br>• differentiate, integrate, and solve problems with exponential, logarithmic, and inverse trigonometric functions;<br>• use separation of variables to solve simple differential equations and solve applied problems involving Newton's Law of Cooling;<br>• compute complicated integrals using a combination of substitutions, algebraic and trigonometric manipulation, partial fractions, and parts;<br>• recognize and compute improper integrals;<br>• compute volumes of solids using washer, shell, and general cross-section methods;<br>• analyze curves given parametrically;<br>• calculate area of a region bounded by a polar graph;<br>• apply convergence tests to a wide range of infinite series;<br>• approximate elementary functions using Taylor polynomials; and<br>• determine Taylor and Maclaurin series of a given function.<br>• In addition to the specific skill-oriented objectives above, students should<br>• have improved skills at problem solving and critical thinking: at dissecting a complex problem, determining steps in its solution, finding the solution, and testing whether it is reasonable; and<br>• be able to provide clear written explanations of the ideas behind key concepts from the course.<br>• Students should also gain an increased appreciation of mathematics as part of the language of science and as a study in itself. |
| ***Classroom Expectations:*** | You are expected to conduct yourself in a respectful and productive manner. In addition to all the rules and expectations listed in the student handbook, I expect you to have a positive attitude, treat others with respect, practice self-discipline, and demonstrate responsibility. If these conditions are not met, you can expect one-on-one meetings with me, parent/instructor conferencing, and administrative action, if necessary. |

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| | **Concerning the use of cell phones and other electronic devices:**<br>Devices should be on silent and kept in your purse, backpack, or pocket during class unless otherwise instructed. You may not place it on your desk. Parents, guardians, and other family members should call the front office in case of emergency.<br>If you violate this rule, you can expect the following consequences:<br>*First offense* – The phone or device will be placed in a phone chart at the front of the room. You may pick it up at the end of class.<br>*Second offense* – The phone or device will again be placed in a phone chart at the front of the room until the end of class and a parent/guardian will be notified.<br>*Third offense* – This is defiance and I will notify an administrator. |
| ***Grading Policy:*** | Major assessments will count 70 percent of your grade. Homework and classwork will account for 30 percent of your grade. Grades will be updated weekly in PowerSchool. Each grading period will consist of nine weeks. |
| ***Make-up Work Policy:*** | Make-up tests will **only** be given to a student who has an **excused absence**. **The student must make arrangements with the teacher to take a make-up test. Tests may be taken during Patriot Path with prior arrangement from each teacher.** A student only has two chances (the next two Patriot Paths after the absence) to make up a test. All make-up tests will be administered in the designated classroom on the Patriot Path session roster.<br><br>Homework/Classwork: Students who are absent for **excused reasons** will be permitted to make up missed work. **It is the student's responsibility to get their work assignments the day upon return to school and complete the assignments according to a time frame determined by the teacher within two weeks of the date of the last absence**. Grades of zero will be assigned for assignments missed because of unexcused absences. |
| ***Textbook:*** | Calculus of a Single Variable, 11th edition. Roland Larson and Bruce Edwards, Cengage Learning.<br>Supplement text: Calculus: Graphical, Numerical, Algebraic. Finney, Demana, Waits, Kennedy, Pearson Prentice Hall, 2003 |
| ***Materials and Supplies Needed:*** | Students are encouraged to bring graphing calculators to each class. Several TI-84+ graphing calculators are provided for in-class use for those students not owning graphing calculators. Since the calculus AP exams now require graphing calculators for some questions, this technology has been extensively incorporated into the curriculum. In-class tests will not require the use of a graphing calculator; however, students will often be allowed to use graphing calculators on certain parts of the exams. The instructor will be using a TI-84 graphing calculator and presentation software, and therefore will provide assistance with the operation of TI-84 calculators. If a student chooses to use a calculator other than the TI-84, he/she is responsible for learning to operate that machine. |

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| ***Laptops*** | Concerning laptop utilization: 1) Student laptops should not be hard-wired to the network or have print capabilities. 2) Use of discs, flash drives, jump drives, or other USB devices will not be allowed on Madison City computers. 3. Neither the teacher, nor the school is responsible for broken, stolen, or lost laptops. 4. Laptops and other electronic devices will be used at the individual discretion of the teacher. |
| ***Accommodations*** | Requests for accommodations for this course or any school event are welcomed from students and parents. |
| ***AP Exam:*** | The AP Calculus exams are scheduled for 8:00 a.m. on Monday, May 13. The fee for an AP Exam is $98 and should have already been paid at registration. |

| **18 – WEEK PLAN *** | |
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| **Week 1** | Transcendental Functions: Differentiation and Integration of Functions with Bases other than e & Applications |
| **Week 2** | Differential Equations: Solving Separable Differential Equations, Growth & Decay, & Newton's Law of Cooling, Slope Fields, & Euler's Method |
| **Week 3** | Transcendental Functions: Differentiation & Integration of Inverse Trig Functions |
| **Week 4** | Applications of Integration: Calculations of Volumes of Solids, Arc Length, and Areas of Surfaces of Revolution |
| **Week 5** | Advanced Integration Techniques: Trigonometric Integration & Integration Using Trig Substitution |
| **Week 6** | Advanced Integration Techniques: Integration Using Partial Fractions & Integration by Tables |
| **Week 7** | Limits: L'Hopital's Rule<br>Advanced Integration Techniques: Improper Integrals |
| **Week 8** | Parametric Equations: Differentiation of Parametric Functions<br>Vector-Valued Functions: Differentiation of Vector-Valued Functions and Calculation of Speed |
| **Week 9** | Infinite Series: Sequences, Series & Convergence, The Integral Test, & p-series |
| **Week 10** | Infinite Series: Comparisons of Series, Alternating Series, Ratio, & Root Tests |
| **Week 11** | Infinite Series: Taylor Polynomials & Approximations |
| **Week 12** | Infinite Series: Power Series and Taylor & Maclaurin Series |
| **Week 13** | Infinite Series: Maclaurin Series for functions $e^x$, sinx, cosx, and 1/(1-x) |
| **Week 14** | Infinite Series: LaGrange Error Bound for Taylor Polynomials<br>AP Exam Review: In-depth Review of Selected AP Topics in Preparation for AP Exam |
| **Week 15** | AP Exam Review: In-depth Review of Selected AP Topics in Preparation for AP Exam |
| **Week 16** | AP Exam Review: In-depth Review of Selected AP Topics in Preparation for AP Exam |
| **Week 17** | AP Exam Review: In-depth Review of Selected AP Topics & AP Exam |
| **Week 18** | Post AP Exam Selected Topics |

***This is a tentative plan and may change at the discretion of the teacher.**