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| Course Title/Number | Calculus with Analytic Geometry I (CT) **MTH 229** – 105 (CRN 3035) |
| Semester/Year | Fall 2018 |
| Days/Time | MTWRF 2:00 – 2:50 |
| Location | Smith Hall 513 |
| Instructor | Dr. Clayton Brooks |
| Office | Smith Hall 723 |
| Phone | (Note: the University does not grant me comprehensive telephone dialing access,  so I am not able to return many calls. With this in mind, the number is x6-6702) |
| E-Mail | brooksc at … |
| Office/Hours | MTWRF 11:00 – 12:00 or by appointment |
| University Policies | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/policies/>   * Academic Dishonesty Policy * Academic Dismissal Policy * Academic Forgiveness Policy * Academic Probation and Suspension Policy * Affirmative Action Policy * Dead Week Policy * D/F Repeat Rule * Excused Absence Policy for Undergraduates * Inclement Weather Policy * Sexual Harassment Policy * Students with Disabilities (Policies and Procedures) * University Computing Services Acceptable Use Policy |

**Course Description: From Catalog**

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| Calculus with Analytic Geometry I (CT). 5 hrs. An introduction to calculus and analytic geometry, emphasizing critical thinking. Limits, derivatives, and integrals of the elementary functions of one variable, including the transcendental functions. (PR: MTH ACT of 27 or above, or C or better in MTH 132) |

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| **Course Student Learning Outcomes** | **How student achievement of each outcome will be assessed in this Course** |
| Students will have an understanding of the fundamental concepts of calculus and an appreciation of its many applications. | Homework and tests |
| Develop critical thinking skills by asking students to convert real-world problems into forms suitable for calculus, and interpret the results of calculus in real-world problems. | Homework and tests |
| A deeper understanding of the mathematics that is used in their science and engineering courses. | Homework and tests |
| Students will develop facility in using graphing calculators to solve mathematics problems. | Homework and tests |
| *Reasoning:* Calculus is a collection of reasoning techniques that allows one to understand how changing quantities behave. This understanding is fundamental to progress in science and engineering. Students will use mathematical reasoning in their study of calculus concepts to verify properties of the concepts they study, and they will use scientific reasoning to determine whether possible solutions are reasonable for a given situation. | Homework and tests |
| *Representations:* Students will work with information specified in verbal, graphical, tabular, and symbolic forms. Many problems will require students to take information in one of these forms, analyze it, and create a solution in a different form. Students will be required to produce verbal explanations of the meanings of mathematical concepts, both in general and in the context of specific problems. | Homework and tests |
| *Information literacy:* To solve the applied problems in this course, students must determine which information in the problem is relevant to the solution, access this information and use it to obtain a mathematical solution, and then translate the mathematical solution back into the language of the original problem. | Homework and tests |

**Required Texts, Additional Reading, and Other Materials**

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| 1. Calculus (early transcendentals) 8/e by James Stewart 2. TI-83/4 or equivalent graphing calculator 3. Standard student access to the University Computing Facilities |

**Grading Policy**

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| 100 points for the total of classroom presentations, homework, projects, and quizzes  100 points for each exam  200 points for the final exam |

**Attendance Policy**

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| A penalty of 1% reduction for each hour late will be assessed for any assignment. Make-up tests will not be given for any unexcused absence. |

**Upload to GEAR**

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| As this is a CT (critical thinking) course. Each student will be required to “upload an artifact to GEAR by the end of the semester.” More details will follow. |

**Tutoring**

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| Tutoring is available from many sources. A primary source is through the Mathematics Department Tutoring Lab which is located in Smith Hall 625 see: <http://www.marshall.edu/math/tutoring/> for more information. |

**Course Schedule**

**Schedule:**

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| **Week** | **Sections** | **Topics** |
| Aug 20 – 24 | Prereq, 2.1 – 2.3 | Brief algebra review, Introduction of limits, Basic limit laws |
| Aug 27 – 31 | 2.3 – 2.5 | Algebraic limits, Formal definition, Continuity |
| Sep 4 – 7 | 2.6 – 2.7 | Limits at infinity, Introduction of derivative |
| Sep 10 – 14 | 2.8, Test | Derivative function, **Test on Sep 14**, |
| Sep 17 – 21 | 3.1 – 3.3 | Algebraic derivatives, Product rules, Trig derivatives |
| Sep 24 – 28 | 3.4 – 3.6 | Chain rule, Implicit differentiation, Logarithmic functions |
| Oct 1 – 5 | 3.7 – 3.9 | Rates of change, Exponential growth and decay, Related rates |
| Oct 8 – 12 | 3.10 – 3.11, Test | Linearization, Hyperbolic functions, **Test on Oct 12** |
| Oct 15 – 19 | 4.1 – 4.3 | Extreme values, Mean value theorem, Shapes of graphs |
| Oct 22 – 26 | 4.4 – 4.5 | L’Hôpital’s rule, Asymptotes |
| Oct 29 – Nov 2 | 4.5 – 4.7 | Graphing, Optimization |
| Nov 5 – 9 | 4.8 – 4.9, Test | Newton’s method,Antiderivatives, **Test on Nov 9** |
| Nov 12 – 16 | 5.1 – 5.2, DA lab | Finite sum approximations, Definite integral, Visit to DA lab |
| Nov 26 – 30 | 5.3 – 5.4, Lab | Fundamental Theorem, Indefinite integrals, Net change, Computer Lab |
| Dec 3 – 7 | 5.5, review | Substitution rule, Review |
| Dec 10 | Final | **Final Exam on Dec 10, 12:45 – 2:45** |