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| Course Title/Number  | Calculus with Analytic Geometry I (CT) **MTH 229** – 102 (CRN 4750) |
| Semester/Year | Fall 2017 |
| Days/Time | MW 2:00 – 2:50 and TR 2:00 – 3:15 |
| Location | Some genius thinks alternating between Smith Hall 335 and 336 is a great idea |
| 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 | MW 3:00 – 4:00, TR 3:30 – 4:30 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/?page_id=802> Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment  |

**Course Description: From Catalog**

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| Calculus with Analytic Geometry I (Honors) (CT). 5 hrs.An introduction to calculus and analytic geometry for honors students, emphasizing critical thinking. Limits, derivatives, and integrals of the elementary functions of one variable, including transcendental functions. (PR: Math ACT 27 or permission of the chair of the mathematics department)) |

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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
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**Grading Policy**

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| 100 points for the total of classroom presentations, homework, projects, and quizzes100 points for each exam200 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. |

**Classroom presentations of advanced problems**

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| As this class has an honors designation, each student will be required to show mastery of various concepts. The primary vehicle for displaying this is to be able to present the results of advanced problems to the rest of the class, and be able to answer any related questions. Each student will be expected to list, in writing, any problems that the student is willing to present, and may be called upon. A written solution must follow a successful presentation. Unsuccessful presentations will not be given any credit.  |

**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 22 – 24 | 2.1 – 2.3 | Introduction of limits, Basic limit laws, Algebraic limits  |
| Aug 28 – 31 | 2.4 – 2.6 | Formal definition, Continuity, Limits at infinity |
| Sep 5 – 7 | 2.7 – 2.8 | Introduction of derivative |
| Sep 11 – 14 | Test | **Test on Sep 14**,  |
| Sep 18 – 21 | 3.1 – 3.4 | Algebraic derivatives, Product rules, Trig derivatives, Chain rule |
| Sep 25 – 28 | 3.5 – 3.6 | Implicit differentiation, Logarithmic functions |
| Oct 2 – 5 | 3.7 – 3.8 | Rates of change, Exponential growth and decay  |
| Oct 9 – 12 | 3.9 – 3.11 | Related rates,Linearization, Hyperbolic functions |
| Oct 16 – 19 | Test, 4.1 – 4.2 | **Test on Oct 17,** Extreme values, Mean value theorems |
| Oct 23 – 26 | 4.3 – 4.4 | Shapes of graphs, L’Hôpital’s rule |
| Oct 30 – Nov 2 | 4.5 – 4.7 | Asymptotes, Graphing, Optimization  |
| Nov 6 – 9 | 4.8 – 4.9 | Newton’s method,Antiderivatives |
| Nov 13 – 16 | Test, 5.1 – 5.2 | **Test on Nov 14,** Finite sum approximations, Definite integral |
| Nov 27 – 30 | 5.3 – 5.5 | Fundamental Theorem, Indefinite integrals, Net change, Substitution |
| Dec 4 – 7 | Lab, review | Computer Lab, Review |
| Dec 11 | Final | **Final Exam on Dec 11, 12:45 – 2:45** |