Applied Calculus

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| **Course Title/Number** | **MTH 140** Sec 104, CRN 3024 |
| **Semester/Year** | Fall 2018 |
| **Days/Time** | T, R 11 – 12:15 |
| **Location** | SH 514 |
| **Instructor** | Dr. Karen Mitchell |
| **Office** | CB132 |
| **Phone** | (304) 696-3042 |
| **E-Mail** | [mitchelk@marshall.edu](mailto:mitchelk@marshall.edu) (karenmitchellmu@gmail.com) |
| **Office Hours** | M, W 3-5; TR 12:30-1:30 and 3:30-4:30  If these hours do not fit your schedule, please call me or send me an email so that we can arrange another time to discuss your questions. |
| **University Policies** | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by 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 [www.marshall.edu/academic-affairs/policies/](http://www.marshall.edu/academic-affairs/policies/). 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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| A brief survey of calculus including both differentiation and integration with applications. Not to be substituted for Mathematics 229.  (PR: C or higher in MTH 127 or equivalent or Math ACT 24 or above) |

**Course Objectives**:

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| This course is a requirement for the 5-9 mathematics education major and several science and technology majors. It may be used by other majors as an elective. |

**The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.**

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| **Course student learning outcomes** | **How students will practice each outcome in this course** | **How student achievement of each outcome will be assessed in this course** |
| Understand, identify and use effectively, families of functions identified in the course outline | group work, discussion, in-class tasks with and without technology, response sheets (low-stakes writing), practice presentations, homework | exam questions, quiz questions, writing assignments, presentations, homework |
| Describe conceptual relationships among key calculus concepts like limit, continuity, derivative, and integral. | group work, discussion, in-class tasks with and without technology, response sheets (low-stakes writing), practice presentations, homework | exam questions, quiz questions, writing assignments, presentations, homework |
| Compute limits, derivatives and integrals from a table, graph or equation | group work, discussion, in-class tasks with technology, response sheets (low-stakes writing), practice presentations, homework | exam questions, quiz questions, writing assignments, presentations, homework |
| Use limits, derivatives and integrals to solve authentic problems and interpret the results | group work, discussion, in-class tasks with and without technology, response sheets (low-stakes writing), practice presentations, homework | exam questions, quiz questions, writing assignments, presentations, homework |

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

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| **REQUIRED MATERIALS:**   1. Calculus for the Life Sciences (2 E) by Greenwell, Ritchey, Lial 2. 3-ring binder (suggested) 3. Marshall computer account 4. Scientific Calculator |

**Course Requirements/Due Dates**

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| **TESTS:** Test I – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (tentative)  Test II – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (tentative)  Test III - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (tentative)  Final – 10:15 – 12:15, December 13, Thursday  **HOMEWORK:** *Homework problems* will be assigned at each class meeting. Some problems will be collected and graded. These will be due on the announced date. Other problems, like the introductory textbook activities, that are assigned to provide you with an opportunity to practice skills or examine concepts will not be collected. I will tell you at the time of the assignment if the problems are to be collected and graded. Since the homework problems are designed to help you prepare for tests and quizzes, you should always make sure you know how to do them. You may ask me questions about the homework assignments. You may discuss homework assignments with your classmates. It is, however, counterproductive for you to merely copy another student’s work. In *writing assignments* you will be asked to reach conclusions about problems from the text, the Web, or other situations. All writing assignments will be collected and graded. *Response sheets* are also always assigned points. *Class presentations* may include presentations to your partner or to the entire class. |

**Grading Policy**

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| **POINT VALUES:** Response Sheets: 5-10 pts. each  Announced Quiz: 20-50 pts. each  Writing assignments: 10-20 pts. each  Class presentation: 10-50 pts. each  Test: 100 pts. each  Homework: TBA  Final: 100 or 200 pts.  PROCEDURE USED TO DETERMINE GRADES: The total number of points you earn will be divided by the total number of points possible to determine your final percentage.  DEPARTMENTAL GRADING SCALE: 90 - 100 A  80 - 89 B  70 - 79 C  60 - 69 D  0 - 59 F |

**Attendance Policy**

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| **ATTENDANCE POLICY:** For any class that you miss, send an email to [karenmitchellmu@gmail.com](mailto:karenmitchellmu@gmail.com) to notify me that you will not be attending that day. Since a significant amount of the material for the course is available only in class, attendance is imperative. You are responsible for all notes and assignments given during any absence. If you are absent when a response sheet, group activity, or other in-class assignment is given, it cannot be made up. If you are aware that you will be missing a test or an announced quiz, make arrangements to make it up before you leave. If some emergency forces you to miss an exam or quiz, see me as soon as you return to class. The Academic Affairs policy for excused absences can be accessed at <http://www.marshall.edu/academic-affairs/?page_id=802> as well as other university-wide policies. If you have an excused absence for a class assignment that cannot be made up, an alternate assignment will be made. |

**Course Schedule**

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| **COURSE OUTLINE:**  Function Review  1. Definition and representation  2. Polynomial  3. Rational  4. Exponential  5. Logarithmic  Limits  1. Definition  2. Numerically  3. Graphically  4. Properties  5. Applications  Continuity  Differentiation.  1. Definition  2. Rates of change.  3. Techniques of differentiation--power, sum, difference, product, quotient, and chain rules.  4. Implicit differentiation.  5. Higher derivatives.  6. Graph sketching.  7. Extrema--maxima and minima.  8. Related rates.  9. Applications  Integration.  1. Antiderivatives and the definite integral.  2. The Fundamental Theorem of Integral Calculus.  3. Techniques of integration--substitution, integration by parts, partial fractions.  4. Tables of integrals.  5. Numerical approximation of integrals.  6. Applications of the integral and solutions of elementary differential equations. |