Course Syllabus

CALCULUS II (Math 132)

Description: *A continuation of MATH 131. Topics include techniques of integration, applications of the definite integral,improper integrals, an introduction to differential equations, convergence of sequences and series, Taylor series, parametric equations, and polar coordinates. Prerequisite: Grade of C- or higher in MATH 131.*

Credit Hours: 4

Audience: Required for many STEM majors. Prerequisite for MATH 253, 264, 265, 320, 451, STAT 441, PHYS 142, 151/2, 253, 352, GE 311, CE 202, CE 334, ME 209, ME 270, ME 352, CHEM 321.

Prerequisites: Grade of C- or higher in MATH 131.

Format: 3 lectures (50 min), 1 computer lab (75 min) per week

Textbook: The open educational resource (OER), i.e. free etextbook, for this course is *OpenStax Calculus: Volume I* located at: https://openstax.org/details/books/calculus-volume-2 (Required). Homework for this course is through the online system WeBWork. There is a $25 fee for WeBWork in lieu of a textbook fee for the course.

Software: Use of *Maple* is common (available on campus computers; purchase of student version is recommended).

Internet: Course material and grades are often maintained in Blackboard, at the discretion of the instructor.

Access & Accommodations: The Access & Accommodations Resource Center (AARC) is the campus office that works with students to provide access and accommodations in cases of diagnosed mental or emotional health issues, attentional or learning disabilities, vision or hearing limitations, chronic diseases, or allergies. You can contact the office at aarc@valpo.edu or 219.464.5206. Students who need, or think they may need, accommodations due to a diagnosis, or who think they have a diagnosis, are invited to contact AARC to arrange a confidential discussion with the AARC office. Further, students who are registered with AARC are required to contact their professor(s) if they wish to exercise the accommodations outlined in their letter from the AARC.

Emergencies: VU's Emergency Notification System (ENS) uses multiple forms of communication, including e-mail, building alarms, outdoor sirens, message boards, computer alerts, Twitter, and public address messaging. Please review the specific procedures for this class found in Blackboard. Remember: "Siren inside, GO outside; Siren outside, GO inside." To evacuate, gather your personal belongings quickly and proceed to the nearest exit. Do not use the elevator. To shelter in place, move away from the windows and stay low to the ground; lock or barricade the door if there is a threat of violence.

Notice of Cancellation:	In the event class is cancelled, you will be notified through your Valparaiso University e-mail account.

Student Learning Objectives:

A. Students can perform algebraic, geometric and technological operations required for success in calculus.
B. Students understand fundamental concepts of integral calculus and infinite series.
C. Students develop and improve analytical thinking for problem solving, both manual and using technology.
D. Students develop a skill-set necessary for success in mathematics (Calculus III in particular) and in disciplines which rely on mathematics.
E. Students can communicate mathematics effectively, with proper notation and terminology.

Topics & Performance Requirements Include (but are not limited to):

1. integration techniques including substitutions, integration by parts, partial fractions, numerical integration, reference to tabulated integrals, solution of improper integrals
2. choosing the appropriate technique for a given integration problem
3. using definite integrals for problem solving, such as determining arc length, surface area volume, and average value of a function
4. understanding how partitioning can be used to solve problems, and how that partitioning leads to definite integrals
5. determining characteristics of infinite sequences, such as alternation, monotonicity, convergence or divergence
6. determining convergence or divergence of infinite series
7. determining intervals of convergence of power series
8. choosing the appropriate convergence test for a given infinite sequence, series, or power series
9. using Taylor series to approximate functions at a point or on an interval
10. performing elementary error analysis, especially for Taylor approximations
11. understanding the relation and differences between infinite sequences and infinite series
12. understanding the relation and differences between regular infinite series and power series
13. understanding convergence of power series and their use in approximating functions
14. translating points and curves between rectangular and polar coordinates
15. describing curves parametrically and plot parametric curves
16. performing calculus operations on functions written in polar and parametric form, such as finding the line tangent to a polar or parametric curve