



Code	CBM202	Prerequisites	CBM201
Name	Vector Calculus	Co-requisites	None

Credits	Contact Hours
05	55
Categorization of credits	
Math and basic science	X
Engineering topic	
Other	

Coordinator's name	Randy Leonardo
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Text book
Stewart, J. (2012) Calculus of several variables. Early Transcendentals. 7th Edition. Mexico: Editorial Cengage Learning.
Other supplemental materials
Larson, R.; Hostetler, Robert P. (2006). Calculus of several variables. 8th Edition. Publisher: McGraw-Hill
Larson, R. (2010). Essential Calculus. Auditorium Editions. Madrid Spain.
Thomas, Jr George B (2010). Calculus of several variables. Twelfth ed. Publisher: Pearson
Chambers, S. (2006). Calculus. 10 Edition. Ed Wiley.
GPL (2016) Geogebra (5.0.259.0) [Free Software] Retrieved from: http://www.geogebra.org

Description
Through the Vector Calculus subject, the student will extend their comprehension and reasoning skills from Differential Calculus in one variable to Differential Calculus in several variables, as well as its applications, from the use of mathematical models that allow student to visualize and explain phenomena of real life.
The Vector Calculus subject includes a study of vectors and geometry of space where surfaces in space are analyzed in different types of coordinates. The dot product, the cross product, equations of lines and planes, as well as their applications, are developed.

Also included is an analysis of everything related to Differential Calculus in various variables and applications, multiple integrals, and areas and volumes are calculated using multiple integrals.	
Type of course	☒ Required ☐ Elective

Specific goals for the course	
Outcomes of instruction	EG1. Create associations and show interest in the information obtained from the graphs and data to increase curiosity about the subject and strengthen intellect. EG2. Allow the help of peers, through integration into work groups, for best understanding and interpretation of content and/or activities presented in class. EG3. Appreciate the knowledge obtained to estimate areas and volumes and shows analytical skills in the construction of vector functions. EG4. Internalize and become aware of the importance of derivatives and integrals to solve environmental problems in which they are applicable.
Student outcomes	CG1. Identify, formulates, and solve complex engineering problems by applying the principles of engineering, science, and mathematics. CG2. Work effectively in teams whose members collectively provide leadership, create a collaborative and inclusive environment, set goals, plan tasks, and meet objectives.

Topics
Unit I. Vectors and Geometry of Space Unit II. Vector Functions Unit III. Partial Derivatives Unit IV. Multiple Integrals Unit V. Vector Calculus