

<i>Course Code</i>	<i>Course Num.</i>	<i>Course Name</i>	<i>Credit Hours</i>	<i>Lec.</i>	<i>Lab.</i>	<i>Tut.</i>	<i>Private study</i>	<i>Pre-requisites</i>	<i>Course Level</i>
MAT	207	Calculus 3	3	3	0	2	8	MAT 116	3

Topics Outline

- **Vectors and Geometry of Space:** Vectors in Space, Dot and Cross Products, Lines and Planes in Space, Surfaces in Space. (2 weeks)
- **Vector-Valued Functions:** Vector-Valued Functions, Calculus of Vector Functions, Motion in Space, Curvature, Tangent and Normal Vectors. (2 weeks)
- **Functions of Several Variables and Partial Differentiation:** Limits and Continuity, Partial Derivatives, Directional Derivatives, The Total Derivative, The Gradient of a Scalar Function, Tangent Plane and Linear Approximation, Chain Rule, Implicit Differentiation, Maxima and Minima and their Tests, Constraints and Lagrange's Multipliers. (3.5 weeks)
- **Multiple Integrals:** Double Integrals in Cartesian Coordinates, Double Integrals in Polar Coordinates, Triple Integrals in Cartesian Coordinates, Triple Integrals in Cylindrical and Spherical Coordinates, Areas and Volumes, Change of Variables in Multiple Integrals. (3.5 weeks)
- **Vector Calculus:** Vector Field, Line and Surface Integrals, Curl and Divergence, Green's Theorem, Divergence Theorem, and Stokes Theorem, Applications. (3 weeks)

Required Textbook

Calculus, 4th Edition; R. T. Smith, R. B. Minton, McGraw-Hill, 2012.

Other references

- *Essential Calculus with Application*; Richard A. Silverman, Dover Publications, 1989.
- *Calculus*; O. Swokowski, et al, PWS Pub. Co.; 6th Edition, 1994.
- *Calculus: Early Transcendentals*, 7th Edition; C. Henry Edwards, David E. Penney, Pearson Prentice Hall, 2008.
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