

MA 1118 — MULTIVARIABLE CALCULUS FOR OPERATIONS RESEARCH (4-0)

Prerequisite: MA1114 or equivalent.

Text: Calculus (Early Transcendentals), 6E Edition, by James Stewart, 2008, Thomson Brooks/Cole, ISBN 0-495-01166-6.

| HOURS | TOPIC | SECTION |
|-------|---|------------------|
| 1-1 | Curves Defined by Parametric Equations | 10.1 |
| 2-3 | Tangents, Areas, Arc Lengths, Surface Areas | 10.2 |
| 1-4 | Polar Coordinates | 10.3 |
| 1-5 | Conic Sections | 10.5 |
| 1-6 | Three-Dimensional Coordinate Systems | 12.1 |
| 1-7 | Vectors | 12.2 |
| 1-8 | Dot Products | 12.3 |
| 1-9 | Cross Products | 12.4 |
| 2-11 | Equations of Lines and Planes | 12.5 |
| 1-12 | Cylinders and Quadric Surfaces | 12.6 |
| 1-13 | Functions of Several Variables | 14.1 |
| 1-14 | Limits and Continuity | 14.2 |
| 1-15 | Partial Derivatives | 14.3 |
| 1-16 | Tangent Planes and Linear Approximations | 14.4 |
| 1-17 | Multivariate Taylor Series; Jacobian & Hessian Matrices | Instructor Notes |
| 2-19 | Chain Rule and Implicit Differentiation | 14.5 |
| 2-21 | Directional Derivatives and Gradient Vector | 14.6 |
| 2-23 | Maximum and Minimum Values | 14.7 |
| 3-26 | Lagrange Multipliers* | 14.8 |
| 1-27 | Double Integrals over Rectangles | 15.1 |
| 1-28 | Iterated Integrals in Cartesian Coordinates | 15.2 |
| 1-29 | Double Integrals over General Regions | 15.3 |
| 1-30 | Double Integrals in Polar Coordinates | 15.4 |
| 2-32 | Applications of Double Integrals | 15.5 |
| 1-33 | Change of Variables in Double Integrals | 15.9 |
| 1-34 | Vector Functions and Space Curves | 13.1 |
| 1-35 | Derivatives and Integrals of Vector Functions | 13.2 |
| 1-36 | Modeling with Differential Equations | 9.1 |
| 2-38 | First-Order Linear DEs; Integrating Factors | 9.5 |
| 5-43 | Exams, Reviews, and Holidays | |

* Third hour to be applied at instructor's discretion to cover topics such as:

- * Problems involving multiple constraints
- * Problems involving quadratic forms that turn into eigenvalue problems
- * Application projects such as those at the end of Section 14.8

Last revised – 12/8/2011 (Daughtry)

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