Shanghai University of Finance & Economics

2018 Summer Program

MAT 23 Calculus 3

Course Outline

Term: June 4 – June 29, 2018

Class Hours: 10:00AM-12:00PM (Monday through Friday)

Course Code: MAT 23

Instructor: Anja Bankovic

Home Institution: Boston College

Office Hours: TBA and by appointment

Email: anja289@yahoo.com

Credit: 4

Class Hours: This course will have 52 class hours, including 32 lecture hours, professor 8 office hours, 8-hour TA discussion sessions, 4-hour review sessions.

Course Description：

This is a lower division course in multivariable calculus with elements of analytic geometry. The course covers differential and integral calculus of functions of several variables. It provides a solid background for students who wish to continue their studies in natural sciences such as mathematics, physics, engineering, finance, economics, and computer science.

The course will start with the study of analytic geometry of vectors, lines, planes, curves, and surfaces. The next major topic is differential calculus and optimization problems, and the final topic includes multiple integrals and surface integrals.

Required Texts:

James Stewart, *Calculus: Early Transcedentals*, 7th ed., Cengage Learning, Belmont, 2010. ISBN: 0538497904.

Grading & Evaluation:

Homework and quizzes: 30%

Midterm: 30%

Final: 40%

100%

Course Schedule:

Week 1:

Session 1: Introduction. Vectors in 2D and 3D.

Session 2: Parametric and symmetric equations of lines and planes

Sessions 3: Curves. Velocity, acceleration, and curvature.

Session 4: Surfaces. Parametrizations of surfaces.

Week 2:

Session 1: Conics and quadratic surfaces.

Session 2: Partial derivatives. Directional derivatives. Gradient.

Session 3: Differentials. Taylor formula in multiple dimensions.

Session 4: Maximum and minimum. Hessian matrix.

Week 3:

Session 1: Lagrange multipliers.

Session 2: Multiple integrals.

Session 3: Change of variables. Jacobian.

Session 4: Line integrals. Fundamental theorem for line integrals. Green's theorem.

Week 4:

Session 1: Surface integrals. Curl and divergence.

Session 2: Divergence theorem and Stokes' theorem.

Session 3: Review