

**İstanbul Commerce University**  
**Faculty of Engineering**  
**MAT121-Mathematical Analysis I**  
2018 FALL

**Instructor:** Abdullah YENER   **Office:** B109 Sütlüce   **Phone:** 4440413/4639   **Email:** ayener@ticaret.edu.tr

**Time and Location:** Wednesday 13:00-16:50, Küçükyalı-Class C-207

**Office Hours:** Monday 13:00-15:00

**Webpage of the Course:** <http://ww3.ticaret.edu.tr/ayener/mat121>

**Textbook:**

- **Main Textbook:** Calculus: Early Transcendentals, Sixth Edition, by James Stewart
- **Reference Books:**
  - Calculus: Early Transcendentals, Fourth Edition, by Dennis G. Zill-Warren S. Wright
  - Thomas Calculus, Twelfth Edition, by George B. Thomas-Maurice D. Weir-Joel R. Hass
  - Calculus: Early Transcendental Functions, Fifth Edition, by Ron Larson, Bruce H. Edwards
  - Calculus: Early Transcendentals, by Jon Rogawski

The origins of calculus began over 2000 years ago in the time of the Greeks, who were interested in (among other things) areas and tangents. However it was not until Newton developed the essentials of calculus in the mid seventeenth century that the problems of finding areas of general shapes and finding tangents to curves were seen to be related. While Newton (and independently Leibniz) developed calculus in only a few years, it was not until the mid nineteenth century that calculus was put on the solid foundation that we know today. Applications of calculus include virtually every area of science along with business and economics.

**Content of the Course:** The course will be centered around several main topics covering the notion of function, continuity, derivatives with applications, the basics of integration and exponential and logarithmic functions with applications.

1. **Functions:** functions and graphs, composite functions, polynomial and rational functions, transadant functions, inverse functions, exponential and logarithmic functions.
2. **Limit:** limit theorems, continuity, trigonometric limits, infinite limits, the formal definition of limits, intermediate value theorem, tangent line problem.
3. **Derivative:** mathematical definition of derivative, power and sum rules, product and quotient rules, derivative of trigonometric functions, chain rule, implicit differentiation, derivative of inverse functions, derivative of exponential and logarithmic functions.
4. **Applications of Differentiation:** related rates, maximum and minimum values, mean value theorem, indeterminate forms and l'Hospital's rule, curve sketching and asymptotes, optimization problems.
5. **Integral:** indefinite integral, integration with substitution, area problem, definite integral, fundamental theorems of calculus.
6. **Techniques of Integration:** substitution method, integration by parts, trigonometric integrals, trigonometric substitution, partial fraction.
7. **Applications of Definite Integral:** area between two curves, volumes of revolution (disk method, method of cylindrical shells), arc length, area of a surface of revolution.

**Grading:**

- Midterm      %40
- Final        %60

**Attendance:** %70 attendance is compulsory.