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## Fundamentals of Analysis for EE, 201.2.5331

Link to the site of the course

[https://www.math.bgu.ac.il/~arkady/Fundamentals\\_Analysis\\_EE/Fundamentals\\_Analysis\\_EE\\_English.html](https://www.math.bgu.ac.il/~arkady/Fundamentals_Analysis_EE/Fundamentals_Analysis_EE_English.html)

### Syllabus:

- 1) Countable and uncountable sets: elements of Set Theory.
- 2) Metric spaces. Examples of Metric spaces. Closed sets, open sets, completeness, compactness. Compact subsets in Euclidean spaces  $\mathbf{R}^n$ . Continuity and uniform continuity of real functions.
- 3) Measure theory.  $\sigma$ -algebras, axioms of measure, measurable sets, examples of measure spaces. Lebesgue measure on the real line. Measurable functions. Lebesgue integral, dominated convergence theorem. Comparison between Lebesgue and Riemann integrable functions.

Recommended literature:

- 1) H.L. Royden, "Real Analysis", Prentice-Hall, 1988
- 2) A. N. Kolmogorov and S.V. Fomin, "Introductory Real Analysis", Dover Publications, 1970.
- 3) Terence Tao, "Analysis I"; "Analysis II"; "An introduction to measure theory".

Some lengthy proofs will be omitted, because there are 11 weeks instead of 13.  
There will be obligatory 4 homeworks, each homework consists of 10 questions.

**Presented solutions should be original, not copied from the Internet sources.**

There will be a special final meeting for oral presentation of solutions of several questions or a final exam.

Attendance of the lectures is mandatory.

Final grade of the course: 50% - homeworks,

50%- or grade for oral presentation,

Or 50%-grade for the final exam (two attempts, as usual)

Will be decided later.