YMX0233 Mathematical Analysis II
spring semester of 2017/18 academic year

3.0 credits 2 1-0-1 E A
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Following items are the subsections in theoretical material but also the questions in examination.

1. Functions of several variables. Graph of function of two variables.
2. Increment of function several variables.
3. Limit of function of two variables.
4. Continuity of function of two variables.
5. Partial derivatives of functions of several variables.
6. Total increment and total differential.
7. Partial derivatives of functions given implicitly.
8. Partial derivatives of composite functions. Total derivative.
9. Partial derivatives of higher order.
10. Directional derivative.
11. Gradient.
12. Divergence and curl.
13. Local extrema of function of two variables.
14. Definition and properties of double integral.
15. Iterated integrals. Evaluation of double integral.
16. Change of variable in double integral.
17. Double integral in polar coordinates.

18. Evaluation of volumes and areas by double integrals.
19. Definition and properties of triple integral.
20. Evaluation of triple integral.
21. Change of variable in triple integral.
22. Triple integral in cylindrical coordinates.
23. Line integral with respect to arc length.
24. Evaluation of line integral wuth respect to ac length.
25. Line integral with respect to coordinates.
26. Evaluation of line integral with respect to coordinates.
27. Green's formula.
28. Path independence of line integral.
29. Surface integral of scalar fields.
30. Surface integral of vector fields.
31. Evaluation of surface integral over the projection.
32. Number series, partial sums and convergence.
33. Comparison test of positive number series.
34. D'Alembert's and Cauchy tests.
35. Integral test.
36. Alternating series. Leibnitz's test.
37. Series with whatever signs. Absolute and conditional convergence.
38. Power series. Abel's theorem.
39. Taylor's series.
40. Fourier' series.
41. Fourier' transform

Literature

Trench. W.F. Introduction to real analysis, Prentice Hall, 2003.

The lectures are on the web-side www.staff.ttu/∼lpallas in file YMX0233 Mathematical analysis II lecture notes.

Spring semester lasts 16 weeks. Every odd week there take place lectures 2 academic hours and once in two weeks exercises 2 academic hours. In lectures will be given theoretical material with examples an in exercises the theory will be applied to solve problems. The semester ends with an examination in writing during the examination session.

To get the credits one has to pass the examination.

Prerequisites for the examination: the student has to pass one exercises test in week 12. This test will be assessed in 100-points system. To pass the test one has to get at least 51 points.

Standard exercises to prepare for the exercises test as well as for the examination are on the web-side in file YMX0233 Mathematical analysis II standard exercises

In the examination will be written the theory and exercises studied in weeks 13th to 16th. An examination ticket contains 2 exercises about topics passed in weeks 13th to 16th and 5 different questions about various items of theory. Both exercises give 20 points and every theoretical question also 20 points. Maximal amount of points for the exam will be 140.

Total amount of points for semester is 240.

The student will be graded according to the following scale.

217 ... 240 points "5" excellent

193 ... 216 points "4" very good

169 ... 192 points "3" good

145 ... 168 points "2" satisfactory

121 ... 144 points "1" poor

... 120 points "0" failed