

DEPARTMENT OF MATHEMATICS  
SYLLABUS

Course # & Name: Mathematics 127A

Recommended Text(s) & Price: Real Mathematical Analysis, C. G. Pugh

Prepared by: D. Fuchs, G.  
Kuperberg, J. Hass

UPC Approval Date: May 2004

Lecture(s)	Sections	Comments/Topics
1-9	Chapter 1: Real Numbers	Section 1: Preliminaries Section 2: Cuts Section 3: Euclidean Space Section 4: Cardinality
10-22	Chapter 2: Topology	Section 1: Metric spaces Section 2: Compactness Section 3: Connectedness Section 4: Open coverings
23-25	Chapter 3: Univariate functions	Section 1: Differentiation (through higher derivatives)

**Additional Notes:**

The number of chapters for each chapter is only estimated. The estimates assume 26 lecture days, e.g., 2 midterms and one review day in a 29-day term.

Section 3.1 is fairly long and it's not clear if it belongs in Math 127A or Math 127B.

The book is somewhat lacking in easy examples. The instructors should understand that students will find the material difficult, especially at the beginning, and lectures should include some supplemental examples and explanations.

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Course # & Name: Mathematics 127B

Recommended Text(s) & Price: Real Mathematical Analysis by C. Pugh

Prepared by: D. Fuchs, G.  
Kuperberg, J. Hass

UPC Approval Date: May 2004

<b>Lecture(s)</b>	<b>Sections</b>	<b>Comments/Topics</b>
1-11	Chapter 3: Univariate functions	Section 1: Differentiation (from smoothness classes) Section 2: Riemann integrals Section 3: Series
12-26	Chapter 4: Function spaces	Section 1: Uniform convergence Section 2: Power series Section 3: Arzela-Ascoli theorem Section 4: Stone-Weierstrass theorem
Time permitting		Section 5: Picard's theorem of ODEs

**Additional Notes:**

Section 3.1 should be covered in either 127A or in 127B. Also, the number of lectures is only estimated.

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Course # & Name: Mathematics 127C

Recommended Text(s) & Price: Real Mathematical Analysis by C. Pugh

Prepared by: D. Fuchs, G.  
Kuperberg, J. Hass

UPC Approval Date: May 2004

Lecture(s)	Sections	Comments/Topics
1-14	Chapter 5: Multivariate calculus	Section 1: Linear algebra Section 2: Derivatives Section 3: Higher derivatives Section 4: Smoothness classes Section 5: Implicit and inverse function theorems
<i>Second half of 127C – 2 options:</i>		
Option 1:		
15-26	Chapter 5: Multivariate calculus continued	Section 8: Multiple integrals Section 9: Differential forms Section 10: Stokes' theorem
time permitting		Section 7: Lagrange multiplier
time permitting		Appendix C: complex numbers
Option 2:		
15-26	Chapter 6: Lebesgue measure	Section 1: Outer measure Section 2: Measurability Section 3: Regularity Section 4: Lebesgue integrals
time permitting		Appendix A: non-measurable sets
time permitting		Appendix C: Riemann integrability in Lebesgue terms

Additional Note: Number of lectures is only estimated.