Maths 21A 2015

This standard multivariable calculus course extends single variable calculus to higher dimensions. It provides a vocabulary for understanding fundamental processes of nature like weather, planetary motion, waves, diffusion, finance, or quantum mechanics. It helps to visualize processes and data. It teaches important background needed for statistics, discrete mathematics, computer graphics, bio medical sciences, bio-informatics or economics. It provides tools for describing curves, surfaces, solids and other geometrical objects in space. It develops methods for solving optimization problems with and without constraints. You learn a powerful computer algebra system. The course will enhance problem solving and visualization skills and prepares you for further study in other fields of mathematics and its applications.

Lectures

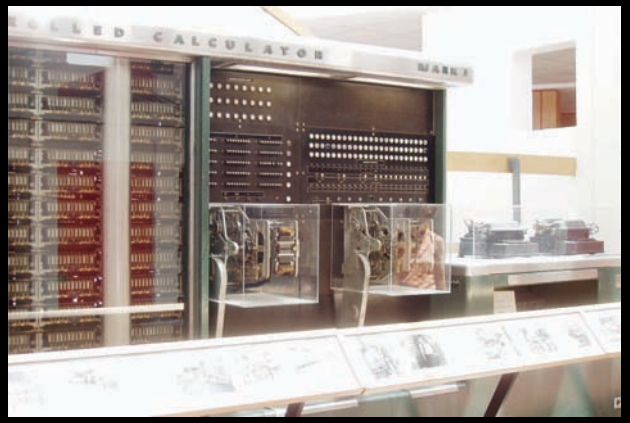
SC Hall E, Tue/Thu 8:30-11:30

1.Exam	2.Exam	Final
July 9	July 23	Aug 6
8:30 AM	8:30 AM	8:30 AM
SC Hall E	SC Hall E	SC Hall E

Part	Grade
1. Hourly	20
2. Hourly	20
Homework	25
Lab	5
Final	30

Seminar

Problem session: Thu 1-2PM
Room SC 110 (close to Mark 1)



Textbook

You do not need a book. If you want to see an other angle, take any of the textbooks available. The Stewart Calculus text is a popular option.

Organisation

Oliver Knill, office:Monday 3:30-5

knill@math.harvard.edu

SC 432, Tel: (617) 495 5549

Course Assistants

Harrel Blatt

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CALENDAR

Su	Mo	Tu	We	Th	Fr	Sa
21	22	23	24	25	26	27
28	29	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

- First class
- Review
- Midterm exams
- Independence day
- Mathematica due
- Final exam

SYLLABUS

1. Week: Geometry / Space

Lect 1-2 6/23 Space, Vectors, Dot Product

Lect 3-4 6/25 Cross product, Lines/Planes

2. Week: Surfaces / Curves

Lect 5-6 6/31 Implicit /Parametric Surface

Lect 7-8 7/2 Curves, Chain Rule, Arc Length

3. Week: Linearization / Gradient

Lect 9-10 7/7 Partial Derivatives, Review

Lect 11-12 7/9 Midterm. Gradient

4. Week: Extrema / Double Integrals

Lect 13-14 7/14 Tangents, Extrema

Lect 15-16 7/16 Lagrange . Double integrals

5. Week: Triple Integrals /Line Integrals

Lect 17-18 7/21 Double and triple integrals

Lect 19-20 7/23 Midterm Line integrals

6. Week: Vector fields /Integral Theorem

Lect 21-22 7/28 Curl, Greens theorem, Flux

Lect 23-24 7/30 Stokes /Divergence theorem

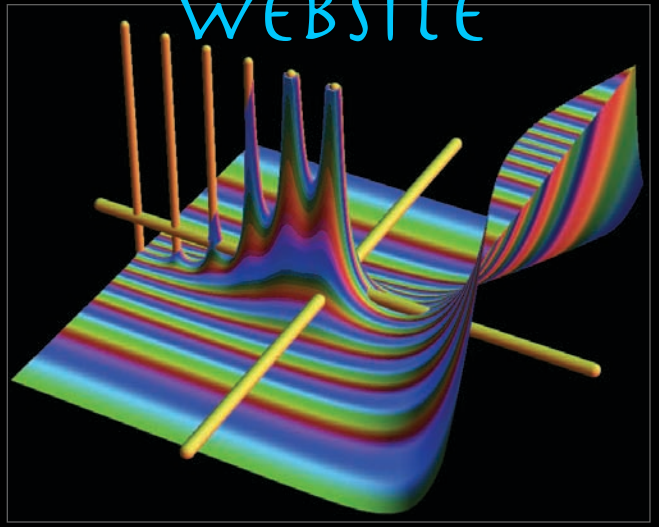
PREREQUISITES

Arithmetic,Algebra,Geometry

Trigonometry, Exp and Log,

Single Variable Calculus

WEBSITE



math.harvard.edu/~knill/courses/summer2015