Sam's inventory of Past exam questions

Link to all old exams: https://mitmath.github.io/1806/old.html

(Note: every semester tends to have slightly different emphasis so interpret problems in context)

(Note: we believe that 18.06 is the most open class worldwide with so many materials available. We hope you find this useful.)

Fall 18

Exam 2:

- Q1 (Projections and fundamental subspaces)
- Q2 (Least-squares)

Exam 3:

- Q1 (Markov matrices & Diagonalization)
- Q3 (Eigenvalues & matrix exponential)

Final:

- Q1 (Diagonalization & ODEs)
- Q2 (QR factorization - Gram Schmidt **not** needed here)
- Q4 (least squares/projections)
- Q6 (least squares)
- Q7 (Block matrices)

Spring 18

Exam 2:

- Q2 (least squares)
- Q3 (svd, projections & fundamental subspaces)
- Q4 (determinants - axiomatic definition)

Exam 3:

- Q1 (eigenvalues/eigenvectors/diagonalization)
- Q2 (eigenvalues and singular values)
- Q3 (positive definiteness)

Fall 17

Exam 1:

- Q1 (linear systems/complete solution to Ax =b)

Exam 2

- Q3 (Least squares/Block matrices)

Exam 3

- Q1 (determinants/eigenvalues/diagonalization)

Final

- Q3 (Projections/least squares)

Spring 17

Exam 1:

- Q2 (Complete solution to Ax = b)

Final:

- Q1 (Fundamental subspaces/projections)
- Q2 (Least squares)
- Q3 (orthogonal matrices and the SVD - part (a) will seem unfamiliar, but solution should make sense)
- Q4 (Fundamental subspaces/projections/eigenvalues)

Fall 14

Exam 1:

- Q2 (Vector subspaces)

Exam 2:

- Q2 (Determinants/inverses/eigenvalues)
- Q3 (Eigenvalues/diagonalization)
- Q4 (Markov matrices)

Exam 3:

- Q1 (Eigenvalues/ODEs/singular values)
- Q2 (Positive definiteness/eigenvalues/similar matrices)
- Q3 (Eigenvalues/svd)
- Q4 (linear transformations)

Spring 14

Final:

- Q1 (fundamental subspaces/complete solution to Ax = b)
- Q7 (svd)

Fall 13

Exam 1:

- Q3 (fundamental subspaces)
- Q4 (bases)

Exam 2:

- Q1 (determinants)
- Q2 (determinants/eigenvalues)
- Q3 (determinants/cofactors)
- Q4 (Projections/volumes)

Exam 3:

- Q2 (general review - true or false)

Final:

- Q1 (projections)
- Q5 (bases and linear transformations)
- Q6(general review - except part g)

Fall 12

Exam 1:

- Q2 (vector subspaces)

Exam 2:

- Q2 (determinants)

Exam 3:

- Q1 (positive definiteness)
- Q2 a-c (eigenvalues and singular values)
- Q3 (Markov matrices)
- Q4 (permutation matrices)

Final:

- Q2 (cofactors)
- Q3a,b (eigenvalues and fundamental subspaces)

Fall 11

Exam 1:

- Q1 (fundamental subspaces and complete solution to Ax = b)

Exam 2:

- Q3 (Determinants)

Exam 3:

- Q2 (SVD)
- Q3 (eigenvalues)
- Q4 (positive definiteness)

Final:

- Q3 (Eigenvalues and similar matrices)
- Q5 (linear transformations)
- Q6 (positive definiteness/eigenvalues/projection matrices/orthogonal matrices)
- Q7 (least squares)