ASTRONOMY 616 Spring 2015 Instructor: Anatoly Klypin

Galaxies and elements of Cosmology 616.

Introduction.
Rotation of Spiral Galaxies
Surface Brighness of Spiral Galaxies
Barred Galaxies
Elliptical Galaxies
Milky Way Galaxy
Local Group
Galaxy Luminocity function
Large-Scale Distribution of Galaxies
Clustering of galaxies: power spectrum and correlation function
Clustering of galaxies: z=0 observational results
1st Midterm exam
Elements of cosmology: Friedmann Equation
FRW metric. Horizon. Distances.
Kinematics of particles
Growth of perturbations: Modes, waves longer than horizon
Linear Growth of perturbations: waves shorter than horizon
Top-hat model of halo collapse
Transfer Functions
Halo Mass Function
Zeldovich Approximation
Halo properties
2nd Midterm exam
Galaxy Formation: stellar feedback processes
Galaxy evolution & Luminosity. Stellar mass functions at different redshifts.
Star formation rates.
Galaxy morphology and color bimodality at different redshifts
Cold flows and hot acretion
Merger rates
Violent disk instabilities at high redshifts
Final Exam

Textbooks: Binney & Merrifield "Galactic Astronomy"
Mo, van den Bosch, White "Galaxy Formation and Evolution"

Two Midterm Exams and one final exam

Grades:

25% for the homeworks, 25% for each exam.
A: 85–100% B: 75–85% C: less then 75%