

AST 4100 001 Course Ref. No. (CRN): 23915 - Term: Winter 2018

AST 4100 Astronomical Techniques Winter 2018

Credit: **3**

Lecture: MFW 9:35 to 10:30 AM in Rm 219 Physics Bldg.

Lecturer: Professor Karur R. Padmanabhan

Office hours: 3-4 pm MW; or by arrangement

Text: Measuring the Universe, George H. Rieke, and Cambridge 2012 (I edition)

Home Work: Weekly Home work problem will be assigned and are due one week after the assignment. The HW will carry 25% of overall grade.

Exams: There will be 2 midterm and one final (cumulative) exam for the course. Each midterm exam will account for 20% points, Final 35% .

Blackboard/CANVAS: All exam information, announcements, reading quizzes (time limited) and post lecture questions (time limited) and exam grades will be posted on Blackboard/CANVAS. They need to be completed within the assigned time window.

Class Schedule**

Week/ dates	Topic	Chapters
1-01/8	Blackbody, Photo effect	
1-01 /10	Compton Effect, Atomic transition	
1-01/12	Wave nature of light, images	1.1-1.3
1-01/15	No school MLK Holiday	
2-01/17	optical systems	1.4
2-01/19	Noise and statistics	1.5
3.-01/22	Telescope, Basics	2.1
3-01/24	Telescope design	2.2-2.3
3-01/26	Telescope –optimization, types	2.4-2.5
4-01/29	Photodetectors basics	3.1 -3.3

4-01/31	Types of photodetectors, arrays	3.4-3.5
4-02/02	IR arrays, CCD, Photomultipliers	3.6-3.8
5-02/05	Imagers and design	4.1.-4.2
5-02/07	IR imagers and data reduction	4.3 -4.5
5-02/09	Astrometry and instrumentation	4.6-4.7
6-02/12	Exam-1 (beginning to chapter 3)	
6-02/14	Stellar and physical photometry	5.1-5.4
6-02/16	Other types ad Polarimetry	5.5-5.6
7-02/19	Spectroscopy-I	6.1-6.2
7-02/21	Spectroscopy-II	6.3
7-02/23	Spectroscopy-III	6.4-6.6
8-02/26	Adaptive optics-I	7.1-7.3
8-02/28	Adaptive optics-II	7.4
8-03-02	Adaptive optics-III	7.5-7.6
9-03-05	Exam-II (Ch. 4-7.4)	
10-03/12	Spring break week	
11-03/19	deconvolution and contrast	7.7-7.8
11-03/21	Bolometers	8.1-8.2
11-03/23	Radio receivers/astronomy	8.3-8.6
12-03/26	Interferometry	9.1-9.3
12-03/28	Optical and infrared interferometry	9.4
12-03/30	Soft X-Rays astronomy	10.1-10.3
13-04/02	Hard X-Rays astronomy	10.4
13-04/04	Gamma Ray astronomy	10.5
13-04/06	Gamma Ray astronomy	10.6

14-04/09	Cosmic rays and gravity waves detection	11.1-11.2
14-04/11	Neutrinos	11.3
14/04/13	Gravitational waves	11.4
15-04/16	Solar studies-I	
15-04/18	Solar studies-II	
15-04/20	Digital sky surveys /virtual observatories	
16-04/23	Review	
16-04/27	Final Exam	

** Subject to change