ASTR 498X Astrophysics of Exoplanets
Syllabus, Fall 2015

Tu-Th 3:30-4:45 CSS 2428

Professor: L. Drake Deming
(office: PSC 1116, e-mail: ddeming@astro.umd.edu)

Office Hours: Monday, 2-4 PM, also by appointment

Required text: "Exoplanets" edited by Sara Seager, 2010, University of Arizona press. ISBN: 978-0-8165-2945-1

The textbook will provide *basic background* for the topics we will discuss in class, but there will also be supplementary readings of journal articles that I will post to ELMS. I will also post my class notes and slides to ELMS. Each thursday, I will assign the supplementary readings for the following week. Textbook Chapters that you should read before each class are listed below (and many of the supplementary readings are also listed). Also each weekend, I will assign homework in the form of simple calculations and questions concerning the readings.

By noon of each class day, I expect to receive an e-mail from each of you, giving one aspect of the readings and homework that you would like to see clarified. You will receive "class participation" points for those e-mails. To guarantee you'll get those points, put 498X in the subject line.

Schedule of Topics/ Assigned Reading

Sept	01	Introduction: Difficulty & History of Exoplanet Detection (Seager & Lissauer Chapter, through Sec. 4)
	03	Astrometry and the Van de Kamp "detections" (Quirrenbach Chapter, Secs. 1, 2.1, & 4)
	08	Pulsar Planets (Wolszczan & Frail paper)
	10	Principle of, and Limits to, Radial Velocity Detections (Lovis & Fischer Chapter, through Sec. 3.3)
	15	51 Peg and the First Hot Jupiters (Mayor & Queloz paper)
	17	First Transit Detections and Transit Surveys (Charbonneau transit paper, Winn Chapter through Sec. 4)
	22	Inflated Radii of Hot Jupiters (Burrows radius paper, Fortney Chapter 4.4)
	24	Atmospheres and Spectral Features of Hot Jupiters (Burrows & Orton Chapter, Secs. 1, 3, & 4)
	29	Transmission Spectroscopy (Brown paper)
Oct	01	Hubble Sodium and Water Detections

(Charbonneau Sodium paper & Deming Water paper - Secs. 1, 5, 6 & 7)

06 NICMOS Spectroscopy and Gaussian Processes
(Swain & Gibson papers)

08 **Quiz 1**

13 Secondary Eclipses
(HD209458b & HD189733b papers)

15 Phase Curves
(Knutson paper)

20 Metallicity of Hot Jupiters
(Kreidberg paper)

22 Hydrodynamics of Hot Jupiter Atmospheres
(Showman Chapter, Secs. 1 & 4)

27 High Contrast Imaging of Young Hot Jupiters
(Marois paper)

29 TPF and Imaging of Earths
(Cash paper)

Nov 03 Kepler Mission 1
(Batalha and Southworth papers)

05 Kepler Mission 2

10 Models of planetary interiors
(Sotin Chapter Secs. 1 & 2, Fortney Chapter, Secs. 3 &4)

12 **Quiz 2**

17 Microlensing
(Gaudi Chapter, Secs. 1, 2.1, 4, 5, 6)

19 Planet Formation
(Roberge Chapter Sec. 1.1 & Pollack paper)

24 Protoplanetary & Debris Disks
(Roberge Chapter Secs. 2 & 3)

Dec 01 Next-generation Radial Velocity Surveys
(Pepe paper)

03 TESS and M-dwarf planets
(Ricker paper)

08 Expectations for JWST
(Beichman paper)

10 Special Topic (TBD)

FINAL EXAM: Saturday Dec 19, 10:30-12:30 AM

Grades in the course will be determined by this weighting: Quizzes each 20%, Final exam 20%, homework and in-class exercises 40%. I guarantee you will receive a grade at least this good, for the following percentages of total points:

A+ 100-97%	A 97-93%	A- 93-90%	B+ 90-87%	
B 87-83%	B- 83-80%	C+ 80-77%	C 77-71%	
C- 71-68%	D+ 68-65%	D 65-60%	D- 60-57%	F < 57%

Depending on the distribution of points in the class, the course grades may be adjusted upward from this scale.

If, for whatever reason, the University is officially closed (e. g., snowstorms) on the due date for homework, the due date will be moved to the next lecture. I DO NOT accept homework submissions by e-mail - you must give me hardcopy. If a student has a planned absence for an academic or other valid reason (including religious holidays), homeworks can be handed in at the next lecture. An excused absence does not mean that you can skip that work, only that you can make it up for full credit. Homework may be handed in late with no excuse, up to one week after the due date, for half credit. After one week late, no homework or activities will be accepted. In the case of absence due to illness on the date an assignment is due, it must be submitted within one week. Contact Professor Deming in cases of prolonged illness.

Per University policy, a self-signed note, attesting to the date of illness must be submitted by the student for absence from ONE lecture. University policy requires that MORE THAN ONE medically-necessary (consecutive or non-consecutive) absences must be documented by the Health Center or an outside health care provider, verifying the dates of treatment and the time period during which the student was unable to meet academic responsibilities. Following any absences, students are responsible for obtaining class notes and any missed assignments.

Students who will miss a quiz/exam for a valid reason may take a full credit makeup, but only if they CALL or E-MAIL Professor Deming BEFORE the quiz/exam. University regulations regarding academic integrity apply to all work performed for credit in this course. Particulars regarding the University policy on academic integrity, including the Honor Pledge, are provided at:

http://www.studentconduct.umd.edu/Info/Students/Default.aspx

The University's Code of Academic Integrity is administered by the Student Honor Council, and as a student you are responsible for upholding these standards for this course. The rules regarding academic integrity apply to homeworks as well as to exams. Students are encouraged to discuss assignments and other class material with each other, but copying or paraphrasing from other students' written answers is not permitted; all written work must be a student's own.

Students with a documented disability who wish to discuss academic accomodations should contact Professor Deming as soon as possible. Students with religious conflicts must also contact Professor Deming in advance before missing class.

I have read the Syllabus for Astr 498X, Fall Semester 2015,

and I understand the policies for the course.

>>> Print Name:_____

>>>> Sign:_____

>>>> Date Signed:_____