

Harry S Truman College
One of the City Colleges of Chicago

COURSE SYLLABUS

Fall 2014

Course Title and Section: **Astronomy 201 PQY**

Credit Hours: 3

Contact Hours: 3

Class Meeting Times: **Wednesday 5:45 – 8:30pm (per schedule online); Room: 3184**

INSTRUCTOR: Dr. Kai Cai

E-MAIL: kcai@ccc.edu

PHONE: 773-907-4347

OFFICE: Main building 3834

OFFICE HOURS: Mon & Wed 10:30am – 12:35pm, Tue & Thu 3:30 – 5:00pm, and by appointment via email

COURSE WEBSITE: ccc.blackboard.com

Course Description: Descriptive Astronomy

Descriptive survey of major astronomical facts, concepts, and relationships, starting with the solar system and extending to stars, galaxies, and cosmogonies. Writing assignments, as appropriate to the discipline, are part of the course. Prerequisite: eligibility for English 101, or English 100 with a grade of C or better, or Consent of Department Chairperson.

Required Textbook and Materials:

Text: *Astronomy, A Beginner's Guide to the Universe* by **Chaisson & McMillan**, 7th edition, Pearson Addison-Wesley™, ISBN13: 978-0-321-81535-4 (student edition); the version bundled with Modified MasteringAstronomy and eText: 978-0-321-97347-4 (available in the CCC bookstore)

6th edition ISBN: 978-0-321-60510-8

Other materials:

A computer with internet access is needed to check course Blackboard site and finish assignments. Students without home internet access may use free WiFi and computers with internet access at Truman, other CCC campuses and all Chicago Public Libraries.

A scientific calculator and a notebook are also needed.

Required and recommended videos: see Blackboard > Web Links

Astronomy: Observations and Theories & Universe: The Infinite Frontier - both are TV series shown on WYCC (TV channel 20) and are available in the library.

Students Course is Expected to Serve: This is an elective course used to satisfy the non-laboratory (pure lecture based) Physical Science component of the Natural Science requirements in general education.

Course Objectives: The main objective is for students to learn about the solar system, stars, other celestial objects and the universe at large from a scientific perspective, to learn to value quantitative observations, and to have knowledge of the sky. The student will learn to use common sense to interrelate the elementary astronomical facts with ordinary simple experiences. Particularly stressed will be how our understanding of the universe has changed, from the days of ancient Greece to the present, because of the development of a scientific attitude, methodology, and technology. Student learning will arise from various activities. Specifically, this involves:

- Applying critical thinking techniques to answer: How do we know what we know? How do we convince others of the new knowledge? Can we apply scientific methodology to repudiating or substantiating related claims in the media?
- Identifying, and locating celestial objects in the sky. .
- Explaining the geometry and basic physics of celestial objects (Solar System, stars, and beyond).
- Classifying celestial objects by using the physical properties of light and geometry (brightness, color, location).
- Appreciating the nature of astronomy with respect to the scale of distances and quantities involved with satisfying curiosity about celestial phenomena.
- Performing simple mathematical calculations using computational aids when appropriate.

Measureable Student Learning Outcomes: in general, the student, upon successful completion of this course, should meet the learning goals listed at the beginning of each textbook chapter. Extremely concisely they are that the student will be able to:

- Discuss the place of the Earth in the Solar System, Milky Way Galaxy, and Universe giving evidence of the spherical shape, rotation and revolution of the Earth.
- Use latitude and longitude to identify geographical locations and time zones on Earth.
- Recognize, explain and reason about day and night sky events.
- Describe the orbital motions of the Earth and the Moon in relation to lunar phases, lunar and solar eclipses, origin of the seasons, etc.
- Describe the composition, structure, likely origin of the solar system and the significance of Kepler's laws.
- Critically reason with the concepts presented in the textbook.
- Recognize, classify and accurately use the vocabulary and images of astronomy.
- Identify the basic physics influencing astronomy such as the properties of gravity, motion, light, and electromagnetic waves.
- Perform simple calculations related to the concepts presented.

- Describe the main characteristics of the heavenly bodies studied.
- Compare the Sun relative to other stars in terms of its magnitude, luminosity, color and type. Describe its position in the Milky Way Galaxy and compare the Milky Way galaxy to other galaxies.
- Accurately describe the life cycle of stars by using the names of the major star types, by using the H-R diagram and by explaining the variety of stellar properties.
- Classify galaxies as elliptical, spiral, or irregular when shown photographs of them.
- Identify the major large scale universe structural features and properties including the Local Group, Hubble's Law and its significance.
- Use technology for internet activities related to the preceding subjects.

Method of Instruction: Lectures, demonstrations, video presentations, online activities, collaborative learning activities are combined in a hybrid format such that the class meets on campus only about half of the scheduled time. More information can be found at <http://tinyurl.com/nh68u9>. Writing is incorporated in the form of essays.

Grade breakdown:

Homework: 200 points (20%)

Projects: 200 points (20%)

Quizzes: 120 points (12%)

Class participation: in-class exercises, class attendance, Blackboard discussions, etc.: 90 points (9%)

Group discussions and presentations: 80 points (8%)

Midterm exams: 200 points (20%)

Final exam: 110 points (11%)

Note: there may be small adjustments especially if it is in the class's best interest to do so.

Your final grade will be determined according to the following scale:

- A 86% -100%
- B 76% - 85%
- C 65% - 75%
- D 55% - 64%
- F < 55%

Definition / Statement of Active Pursuit of the Course:

District and College attendance policies are listed in the college catalog and the Student Policy Manual: <http://www.ccc.edu/departments/Documents/studentpolicymanual.pdf>

At midterm all professors must submit a grade that reflects the performance of each student. Students will be dropped from the class for lack of active participation for any of the following reasons:

- 1) 50% of lectures (over three absences or two unexcused absences)
- 2) 50% of homework

- 3) 50% of quizzes and exercises
- 4) 50% of Tests

A student who is not actively participating in any one of the items listed above can be dropped at the midterm and receive a grade of ADW (Administrative Withdrawal).

NSW (No Show Withdrawal): If a student registered for the course before the start time of the first class period, but 1) did not attend the first two classes, or 2) attended only one of the first three classes and failed to notify the instructor of his or her intentions to continue the class, the Registrar's Office will remove the student from the course.

Lectures:

As outlined by the tentative schedule on page 7, we will only meet about ten times so it is very important that you attend all lectures. Some lectures may include extra materials which may appear in exams. To avoid disruptions, students are expected to arrive on time and to remain in class for the entire duration, and actively participate in the class activities. If you are late, sit near the door quietly and come to the podium only during the break. Students are expected to read the assigned/relevant topics on the textbook *before* each session and take careful notes in the lectures. Cell phones or similar electric devices should not ring or make noise anytime while class is in session. Side conversations are prohibited. Students who impede the learning of others may be asked to leave for the remainder of the lecture or laboratory and may be subject to disciplinary action.

Homework Assignments:

It is important that you do assigned reading each week, monitor the course Blackboard site for announcements and view the assigned videos. Most homework will be assigned weekly, and to be submitted online at www.pearsonmastering.com by the following week. The exact due date for each of the homework will be announced in class when assigned and posted on the MasteringAstronomy website. Late work will be accepted and receive only partial credit (typically you lose 10% each day after the deadline). The instructor will not offer any assistance with late homework assignments. A waiver of the late penalty given extenuating circumstances may be considered on a case-by-case basis with appropriate documentation. Course ID on MasteringAstronomy: **cai99831**

Projects:

There will be a few projects involving writing essays and possibly drawing. These are to be turned in individually or in groups, which is specified at the time of the assignment. Copying or plagiarism will not be tolerated and will result in a grade of zero for the project. Late work will receive only partial credit.

A tentative list of projects (details will be provided later):

- 1) Moon Journal
- 2) Astronomer Essay
- 3) Adler Planetarium Field Trip
- 4) Term Paper

Online Activities:

During the off-campus days, students are expected to read through the assigned sections of the textbook and required internet readings, and to watch required videos online. Then students can proceed to complete homework assignments, Blackboard quizzes, and other applicable assignments (like projects) by the respective due dates.

Observing Sessions:

Weather permitting, there will be occasional observing sessions and there is NO make-up for any of these sessions.

Blackboard Discussions:

Each student is expected to post at least four Blackboard discussion posts throughout the semester. This will be counted as a part of your class participation (see **Grade breakdown** on page 3).

Quizzes:

There will be announced and/or unannounced quizzes approximately every other week, except for the weeks of midterms and final. Several quizzes will be set up on Blackboard and to be taken there within the time frame specified. A grade of zero will be entered for a missed quiz. NO make-up quiz will be given. At the end of the semester, the lowest quiz score may be dropped.

Exams:

There will be two midterm exams (100 points each) and one comprehensive final exam (110 points). The midterm tests will be given in the classroom during class time. Make-up exams will be given only under extreme circumstances and solely at the discretion of the instructor.

Attendance and absentee policy:

Each student must sign the attendance sheet at each class. If a student misses a class due to illness or family reasons or religious observances etc., it is the student's responsibility to notify the instructor ahead of time, if possible. The student may be requested to provide valid written documentation. Two late arrivals and/or two instances of leaving class early equal one absence. Note absence does not excuse a student from completing the course homework and/or Blackboard quizzes (and other applicable assignments). Students are responsible for all missed announcements, assignments and other class work. If a student misses a class he or she should do the following: a) check announcements on Blackboard, b) read through the materials covered in the missed class, and c) attempt to do the homework problems or other applicable assignments. If a student misses over half of the classes before midterm, he or she will be dropped with an ADW at midterm (see the top of page 4). At the end of the semester, attendance record will be counted as a part of the participation points and accounts for no more than 5% of the overall grade. If you wish to withdraw from the class, it is your responsibility to do so officially by Monday, **November 17**. After the midterm, if you simply quit coming to class without dropping the course, you will receive a grade of F and lose your tuition.

Last day for student-initiated withdraw: November 17, 2014

Academic integrity: The City Colleges of Chicago is committed to the ideals of truth and honesty. In view of this, students are expected to adhere to high standards of honesty in their academic endeavor. Plagiarism and cheating of any kind are serious violations of these standards and will result, minimally, in the grade of “F” by the instructor.

Student Conduct: City Colleges of Chicago students are expected to conduct themselves in a manner which is considerate of the rights of others and which will not impair the educational mission of the College. Misconduct for which students are subject to College Discipline (e.g. expulsion) may include the following: (1) all forms of dishonesty such as stealing, forgery, (2) obstruction or disruption of teaching, research, administration, disciplinary proceeding, (3) physical or verbal abuse, threats, intimidation, harassment, and/or other conduct that threatens or endangers the health or safety of any person, and (4) carrying or possession of weapons, ammunition or other explosives.

Compliance with the Americans with Disabilities Act (ADA): It is the policy of the school to make reasonable accommodations for qualified students with disabilities, in accordance with the Americans with Disabilities Act (ADA). If you need accommodations to complete your course requirements, you must notify the Disability Access Center (more information below) and ask them to issue a letter documenting the accommodations you need. You should then notify me within the first two weeks of class, along with the letter.

Truman College General Education Goals

The student exhibits social and ethical responsibility and is aware of her or his place in the global community.

The student performs effectively in the workplace and has the ability to work and make effective use of a wide variety of current technologies.

The student communicates effectively in both written and oral formats.

The student demonstrates the ability to think critically, abstractly, and logically.

The student gathers, interprets and analyzes data.

The student demonstrates the ability to work independently.

Topical Outline (subject to adjustments):

Class Meeting Dates/Weeks	Schedule
Week 1 (August 27)	Introduction; Chapter 0
Week 2 (September 3)	Chapter 0-1 (Lunar Phases & Celestial Mechanics)
Week 3 (September 10): off-campus	Review Chapter 0-1, Read Chapter 2, prepare for Quiz 1
Week 4 (September 17)	Section 1.4; Chapter 4 (Section 4.1-4.3) & Chapter 5; Quiz 1
Week 5 (September 24): off-campus	Read Chapter 2-3, prepare for Exam 1
Week 6 (October 1)	Chapter 2 & 3, Chap. 10.1-2; Moon Journal due
Week 7 (October 8): off-campus	Read Chapters 5-8, finish Quiz 2 on Blackboard
Week 8 (October 15)	Finishing Chapter 3, planets overview; Exam 1
Week 9 (October 22)	Chapters 7,8,9; Astronomer Essay due (first draft)
Week 10 (October 29): off-campus	Read Chapters 10-12, finish Quiz 3 on Blackboard
Week 11 (November 5)	Chapters 10-12, exoplanets (Section 4.4)
Week 12 (November 12): off-campus	Finish Quiz 4 on Blackboard; prepare for Exam 2
Week 13 (November 19)	Chapter 12-13; Exam 2
Week 14 (November 26): off-campus	Read Chapter 14 and parts of Chapter 18; finish Quiz 5 on Blackboard
Week 15 (December 5)	Chapter 14-17
Week 16 (December 12)	Chapter 17; Review & Final Exam ; Term Paper due

COURSE READING & VIEWING OUTLINE

Text: *Astronomy A Beginner's Guide*, 6th/7th ed., by Chaisson & McMillan

**Video Series: A = *Astronomy: Observations & Theories* = New TV series
 U = *Universe: The Infinite Frontier* = Old TV series**

Starting on August 18, *Astronomy: Observations & Theories* is shown on TV Channel 20, 4:00-5:00 am on Mondays. It is also available in the library (see below).

<u>Week</u>	<u>Topic</u>	<u>7th ed. pages</u>	<u>Video Lessons</u>
1	Charting the Heavens (Ch. 0.1-2, 0.5), Scientific Method Earth's Motions Time Zones	1-11, 18-22	A & U-1, 2, 3
2	Phases of the Moon Copernican Revolution (Ch. 0.3-4, 1.1-1.3)	12-18, 24-35	A-3, 4, U-4, 5
3-4	Newton's Laws (1.4); The Solar System (Ch.4), Earth and Its Moon (Ch.5)	36-39, 98-125, 134-158	A-16, 19, U-19 to 21
5-8	Light and Matter (Ch.2), Stellar Properties (Ch.10.1-2), Telescopes (Ch.3)	42-95, 268-275	A-5, 6, 8, U-6, 7, 9
Exam 1			
9	Jovian Planets (Ch. 7), Moons, Rings (Ch. 8), Sun (Ch. 9)	192-265	A-7, 18, U-8, 22 & 23
11	Stellar Properties (Ch.10.3-7), Interstellar Medium (Ch.11), & Stellar Evolution (Ch.12), exoplanets (§4.4)	275-345, 125-131	A-8, 9, 10, U-9 to 12
13	Neutron Stars and Black Holes (Ch.13)	348-373	A-10, 11, U-12, 13
Exam 2			
15	Milky Way, Normal Galaxies, (Chs.14-15), Galaxies and Dark Matter (Ch.16)	378-455	A-12, 13, U-14, 15
16	Cosmology (Chap.17), Life in the Universe (Ch. 18, optional)	458-501	A-15, 20, U-17, 18, 26

More Information on the recommended video programs:

Astronomy: Observations and Theories is a documentary television series consisting of 20 twenty-eight minute episodes (or lessons). This series is currently being aired by WYCC (TV channel 20) every Monday from 4:00am to 5:00am. You can record it for later viewing, and it is also available for viewing in the library (AV Reserve) at Truman. More details of the series can be found at: <http://en.wikipedia.org/wiki/Astronomy: Observations and Theories>

Universe: The Infinite Frontier is an older 26-episode television series that originally broadcast in 1994 by PBS. It is the basis of CCC CDL Astronomy 201 telecourses. This series is also available in Truman's library.

<http://en.wikipedia.org/wiki/Universe: The Infinite Frontier>

Cosmos: A Spacetime Odyssey: a new documentary TV series came out earlier this year, presented by astrophysicist Neil deGrasse Tyson.

<http://en.wikipedia.org/wiki/Cosmos: A Spacetime Odyssey>

<http://www.cosmosontv.com/> and <http://channel.nationalgeographic.com/channel/cosmos-a-spacetime-odyssey/> has some slips.

Academic Support Services:

Numerous academic support services are available to students of Truman College.

Tutoring Center - for students who need help with their assignments: Room 177, McKeon Building, 773-907-4785, <http://www.ccc.edu/colleges/truman/departments/Pages/Tutoring.aspx>

Writing Center - offers free writing assistance to Truman students enrolled in any credit course. Writing consultants, who are also professors at the college, provide feedback and instruction on any stage of the writing process in any class subject. Students can visit the Center to make half-hour or one-hour appointments with writing consultants for tutoring sessions on essays or other writing assignments, as well as placement test preparation, and writing workshops on various topics. The Writing Center is located in Room 1435 of the main building and is open Monday-Thursday from 9am to 7pm and Friday-Saturday from 11am to 2pm. 773-907-4387.

Math Center – Room 1220, main building. Offers group math workshops etc. 773-907-6832.

GradeFirst: a “web-based student support tool”

<http://www.ccc.edu/colleges/truman/menu/Pages/Grades-First.aspx>

Student Success and Leadership Institute (SSLI) - for students who need various other support services to achieve their educational goals: Room 1435, 773-907-4714.

TRIO Student Support Services: for low-income students, first generation college students, or students with disabilities who need academic support: Room 1435, 773-907-4784, <http://www.ccc.edu/colleges/truman/departments/Pages/TRiO-Student-Support-Services.aspx>. Registration is required at the start of each semester.

Wellness Center: provides a variety of services to students at no cost, including personal counseling, crisis intervention, support groups and more. Room 1946, 773-907-4786.

Disability Access Center: the Center verifies needs pursuant to the American Disabilities Act (ADA), determines student academic accommodations, and issues accommodation letters. Registration is required at the start of each semester. Recently moved to Room 1435 in the main building. 773-907-4725.

<http://www.ccc.edu/colleges/truman/departments/Pages/Disability-Access-Center.aspx>

Transfer Center: 773-907-4724; Room 1435, main building.

FERPA

FERPA (Family Educational Rights and Privacy Act) is a federal law that protects the privacy of student educational records. Faculty cannot reveal information about students, or discuss student records over the phone or unsecure e-mail. CCC student e-mail meets FERPA requirements. See: www.ed.gov/policy/gen/guid/fpco/ferpa/index.html.

Please note: the instructor reserves the right to update this syllabus at any time.

Appendix: a list of student presentation opportunities

- A constellation in the northern sky: any week (i.e., when you are ready)
- Ancient Greek Astronomy (Section 1.1, page 26-27): Week 2
- Earth's Atmosphere, including the Greenhouse Effect (Chapter 5): Week 4
- The Tides: Chapter 5 (§5-2): Week 4
- The surface of the Moon (Chapter 5): Week 4
- Electromagnetic Spectrum (Section 2.3, page 48-50): Week 6
- The temperature scales (page 51): Week 6
- Reflection and Refraction (Chapter 3): need some research, Week 6
- A particular big telescope (e.g., the Keck telescopes or the Hubble Space Telescope):
Week 6
- Modern detectors (CCDs): page 76-77, Week 6
- Radio telescopes (Chapter 3): Week 8
- Infrared telescopes (Chapter 3): Week 8
- X-ray and gamma-ray telescopes (Chapter 3): Week 8
- The surface of Venus (Chapter 6): Week 4 or 6
- The surface of Mars (Chapter 6): Week 4 or 6
- Jupiter's Atmosphere (Chapter 7): Week 9
- Saturn's Rings (Chapter 7): Week 9
- Titan (a moon of Saturn, Chapter 7): Week 9
- The Solar atmosphere layers (Chapter 9): TBD
- NASA's Voyager 1 mission: TBD
- NASA's Pioneer 10 mission (Chapter 18): TBD
- The SETI Institute (Chapter 18): TBD
- Hubble's Galaxy Classification (§15.1): TBD
- Hubble's Law (§15.3): TBD

There may be more opening along the way – please pay attention to the announcements!