

COURSE OUTLINE		
TERM: FALL 2019	COURSE NO: ASTR 142	
INSTRUCTOR:	COURSE TITLE: INTRODUCTION TO COSMOLOGY – THE STORY OF THE UNIVERSE	
OFFICE: LOCAL: E-MAIL: @capilanou.ca	SECTION NO(S):	CREDITS: 3.0
OFFICE HOURS:		
COURSE WEBSITE:		

Capilano University acknowledges with respect the Lil'wat, Musqueam, Squamish, Sechelt, and Tsleil-Waututh people on whose territories our campuses are located.

COURSE FORMAT

Three hours of instructional time consisting of demonstration of theory, in-class discussions and problem-solving, plus an additional hour delivered through online or other activities, for a 15-week semester, which includes two weeks for final exams

COURSE PREREQUISITES/COREQUISITES

Precalculus 12 (pass) or Principles of Math 12 (pass) or Precalculus 11 (B); or Principles of Math 11 (B); or Foundations of Mathematics 11 (A); or MATH 105 (pass). MATH 105 may be taken concurrently.

CALENDAR DESCRIPTION

A qualitative study of the universe as a whole: its birth, growth, shape, size and eventual fate. Cosmological principles underlying current knowledge are presented. The "Big Bang", cosmic microwave background and nucleosynthesis are described. The expansion of the universe is presented with predictions for the Universe's fate. The relative nature of space and time, the evidence for dark matter and dark energy and competing theories seeking to explain the nature of the universe are discussed.

COURSE NOTE

ASTR 142 is an approved Quantitative/Analytical course for baccalaureate degrees.
 ASTR 142 is an approved Science course.
 ASTR 142 is an approved Science and Technology course for Cap Core requirements.

REQUIRED TEXTS AND/OR RESOURCES

- Bennett, Jeffrey, et al. The Cosmic Perspective. 8th ed. San Francisco: Pearson, 2017.

COURSE STUDENT LEARNING OUTCOMES

On successful completion of this course, students will be able to do the following:

- express scientific/physical information with proper units and notation
- explain the scale and range of interactions between galactic structures
- demonstrate familiarity with the scale of distances, velocities and other physical quantities defining galaxies
- recognize and explain the principles of physics that are relevant to understanding the observed universe;
- apply these principles of physics in solving appropriate problems; and
- appraise the significance of media reports on new cosmological discoveries and hypotheses.

Students who complete this Science and Technology course will be able to do the following:

- Apply numerical and computational strategies to solve problems.
- Assess the cultural, economic, and political effects of technology.
- Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
- Explain how scientific inquiry is based on investigation of evidence and evolves based on new findings.

COURSE CONTENT

Topics for detailed discussion will be selected from the textbook chapters listed below. Additional readings from current literature or news media may be assigned during the term.

Weeks	Topic
1-2	Scale of the Universe, appropriate Units, reflection about results, approximations and analogies to how the Universe works
3	The Deep Field observations of the Night Sky
4	20th Cent History of Astronomy
5-7	Stellar Spectroscopy, Standard Candles, Doppler/Hubble/Red Shift, Plank Radiation
8-9	Hertzsprung-Russell Diagrams, globular clusters, Galactic Spectroscopy
10	Hydrostatic Equilibrium, Stellar Evolution, Relationship to nuclear stability
11	Galactic rotation curves, Dark Matter, Dark Energy/Modified Gravity
12-13	The Big Bang, Cosmic Microwave Background, Relativity
14-15	Final Exam Period

EVALUATION PROFILE

Final grades for the course will be computed based on the following schedule:

Midterm(s)	20%
In-class work	10%
Assignments	10%
Project	20%
Performance Evaluation	10%
Final Examination	30%
TOTAL	100%

PERFORMANCE EVALUATION

In the absence of exceptional circumstances, which are at the instructor's discretion, the performance evaluation component of the final grade will be prorated to the rest of the grade. For example, a 10% performance evaluation component would be determined by dividing the remaining mark out of 90 by 9. The most common circumstance justifying an increased performance evaluation mark is a student's improved performance in the final examination relative to the midterm exam(s), which the instructor feels justifies an elevated letter grade.

GRADING PROFILE: Letter grades will be assigned according to the following guidelines:

A+	90 - 100	B+	77 - 79	C+	67 - 69	D	50 - 59
A	85 - 89	B	73 - 76	C	63 - 66	F	0 - 49
A-	80 - 84	B-	70 - 72	C-	60 - 62		

Students should refer to the University Calendar for the effect of the above grades on grade point average.

Incomplete Grades

Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

Missed Exams/Quizzes/Labs

Make-up work is given at the discretion of the instructor. Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In certain exceptional situations the student will be permitted to write a make-up test, defer the lab to a later date, or to replace the score by other marks (see below). The date and timing of any make-up option is at the discretion of the instructor. It may not be possible to reschedule certain labs, tests, or other activities.

A score of zero may be avoided when the student meets all of the following conditions:

1. Circumstances are beyond the control of the student which resulted in the exam, test, quiz, lab, etc. to be missed. Such circumstances include serious illness or injury or severe personal crises. They do not include forgetting about the test, lack of preparation for the test, or work-related or social obligations.
2. The student has notified the instructor (or the School of STEM office staff, if the instructor is not available) about the missed exam, test, quiz, lab, etc. Such notification must occur in advance or, at the latest, on the day of the exam, test, quiz, lab, etc.
3. Evidence of the circumstances may be requested. Proper medical documentation of illness or injury may be required from a doctor.
4. The student has been fully participating in the course up until the circumstances that prevented the writing of the exam, test, quiz, lab, etc. Fully participating means regularly attending labs and lectures and turning in assignments in the course.

Attendance

Students are expected to attend all classes and associated activities. If classes are missed, it is the student's responsibility to become aware of all information given out in the classes or tutorials, including times of examinations and assignment deadlines.

English Usage

Students are expected to use correct standard English in their written and oral assignments, exams, presentations and discussions. Failure to do so may result in reduced grades in any part of the Evaluation Profile. Please refer to the guidelines provided in the Capilano Guide to Writing Assignments (available from the University Bookstore).

Electronic Devices

Students may use electronic devices during class; however an instructor may ask for devices to be put away if they become a distraction to other students or interfere with classroom learning.

On-line Communication

Outside of the classroom, instructors will (if necessary) communicate with students using either their official Capilano University email or Moodle; please check both regularly. Official communication between Capilano University and students is delivered to students' Capilano University email addresses only.

UNIVERSITY OPERATIONAL DETAILS

Tools for Success

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <https://www.capilanou.ca/student-life/>

Capilano University Security: download the [CapU Mobile Safety App](#)

Policy Statement (S2009-06)

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Cheating and Plagiarism, Academic Probation and other educational issues. These and other policies are available on the University website.

Academic Integrity (S2017-05)

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. [See policy for more information: <https://www.capilanou.ca/about-capu/governance/policies/>]

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. . The University expects all Students and Members of the University Community to abide by all laws and University policies, including B.401 Sexual Violence and Misconduct Policy and B.401.1 Sexual Violence and Misconduct Procedure (found on Policy page <https://www.capilanou.ca/about-capu/governance/policies/>)

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.

DEPARTMENT OR PROGRAM OPERATIONAL DETAILS

Professionalism

Students are expected to demonstrate a professional attitude and behaviour: reliability, respect for and cooperation with colleagues, willingness to work calmly and courteously, respect for equipment and systems, and constructive response to criticism.