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|---|--|---------------------|
| <b>COURSE OUTLINE</b>                                 |  |                     |
| <b>TERM: SPRING 2019</b>                              | <b>COURSE NO: ASTR 300</b>                               |                     |
| <b>INSTRUCTOR:</b>                                    | <b>COURSE TITLE: THE SEARCH FOR LIFE IN THE UNIVERSE</b> |                     |
| <b>OFFICE: LOCAL:</b><br><b>E-MAIL: @capilanou.ca</b> | <b>SECTION NO(S):</b>                                    | <b>CREDITS: 3.0</b> |
| <b>OFFICE HOURS:</b>                                  |  |                     |
| <b>COURSE WEBSITE:</b>                                |  |                     |

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 class time plus an additional hour of supplemental activity delivered through on-line or other activities for a 15-week semester, which includes two weeks for final exams.

### **COURSE PREREQUISITES**

45 credits of 100-level or higher coursework

### **CALENDAR DESCRIPTION**

Is there Life in the Universe beyond that which we find on Earth? This is a question that has inspired many people in many different disciplines that leads to further questions about the origin of life at the microscopic scale to formation of planets in the far reaches of our galaxy. This is an interdisciplinary course that will explore the possibilities for life existing outside of Earth, the conditions required for that life to exist, and how we can search for and detect life. This course will focus on the biological origins of life, the science and technology used to observe and detect the global effects of biological life, and the astronomy of our solar system, exoplanets, and celestial observation techniques.

### **COURSE NOTE**

ASTR 300 is an approved Science and Technology course for Cap Core requirements.

ASTR 300 is an approved Science course.

### **REQUIRED TEXTS AND/OR RESOURCES**

- Bennet, Jeffery O., Shostak, G. Seth. (2016) *Life in the Universe*, Fourth Edition. San Francisco, CA. Pearson
- Selected journal and news articles

### **COURSE STUDENT LEARNING OUTCOMES**

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

- Synthesize and summarize current scientific literature
- Compare different measuring techniques of celestial objects
- Interpret data from astronomical observations
- Predict physical properties of celestial objects based on observed parameters
- Evaluate hypotheses about the origin of life on Earth
- Explain criteria for planetary habitability
- Develop criteria to identify “life” and “intelligence” and explain how these criteria may inform the search for extraterrestrial life

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

- 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).
- Demonstrate how a problem, concept, or process can be modelled numerically, graphically, or algorithmically.
- 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  | Chapters |
|-------|--|----------|
| 1-2   | Science and the search for life in the universe              | 1-3      |
| 3-5   | Habitability of Earth, origin and evolution of life on Earth | 4-6      |
| 6     | Future habitability of Earth                                 | 10       |
| 7-9   | Searching for life in the solar system                       | 7-9      |
| 10    | Searching for life in the galaxy                             | 11       |
| 11    | Searching for extraterrestrial intelligence                  | 12       |
| 12-13 | Student presentations  |          |
| 14-15 | Final Exam Period  |          |

**EVALUATION PROFILE**

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

|                             |     |
|-----------------------------|-----|
| Midterms (2)                | 20% |
| Project/Poster/Presentation | 15% |
| Writing Assignment(s)*      | 20% |
| In-class Discussion**       | 10% |
| Final Examination           | 35% |

|       |      |
|-------|------|
| TOTAL | 100% |
|-------|------|

\*Writing assignments may include short essays, term papers, or annotated bibliographies. Details for each term will be discussed in class.

\*\*Students will be assessed on their preparedness and participation in classroom discussions.

**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.

### Late Assignments

Assignments are due at the beginning of the class on the due date listed. If you anticipate handing in an assignment late, please consult with your instructor beforehand.

### 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: <http://www.capilano.ca/services/>

**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, Academic Integrity, 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 S2017-05 for more information: <http://www.capilano.ca/about/governance/policies/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](#).

**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.