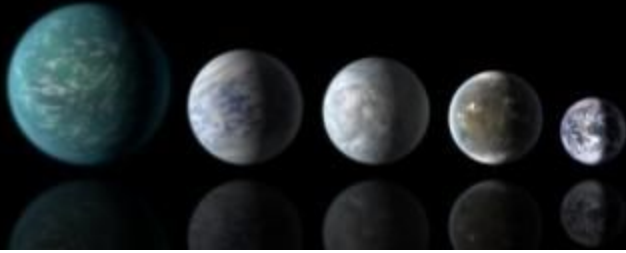




BOISE STATE UNIVERSITY
UNIVERSITY FOUNDATIONS



UF100: Alien Worlds, Alien Life

THE UNIVERSITY FOUNDATIONS CURRICULUM is designed to prepare Boise State graduates for their lives and careers. These courses broaden and enhance the more focused study done within each major; they help students discover more ideas, develop different ways of knowing, and connect with more people. This broad foundation deepens what students KNOW, what they can DO, and who they can BECOME.

COURSE THEME: ASTRONOMY AND ASTROBIOLOGY

COURSE: Fall 2019, UF 100: Alien Worlds, Alien Life

MEETING TIME/PLACE: Tuesdays & Thursdays, 12-12:50pm in [Multi-Purpose Classroom Bldg](#) (MP), room 101

INSTRUCTORS:

Prof. Brian Jackson - bjackson@boisestate.edu

Dr. Jennifer Black - jblack@boisestate.edu

Wesley Sandidge - wesleysandidge@u.boisestate.edu

Michelle Szurgot - michelleszurgot@u.boisestate.edu

OFFICE HOURS: Tuesdays and Thursdays, 10-10:50a

In-Person - MP, room 426

Virtual - over Google Hangouts, chat name: bjackson@boisestate.edu

COURSE DESCRIPTION:

UF100 - Alien Worlds, Alien Life is an introductory course designed for all students, surveying the burgeoning field of planetary astronomy and how these discoveries have revolutionized the search for extraterrestrial life. The course will also explore cultural and historical connections with astronomy and how astronomical discoveries have shaped and been shaped by the societies in which they occur. Students will learn how to capitalize on the opportunities at Boise State University and form their own perspectives on the intersection between science and culture.

The course will also provide an introduction to philosophical aspects of science, such as scientific falsifiability, and group projects and outreach assignments throughout the semester will provide venues for students to practice communicating technical ideas to the public. Students will even have the opportunity to conduct their own astronomical observations.

UNIVERSITY FOUNDATIONS 100 (UF 100) is the first course in the 36-credit University Foundations curriculum. Each UF 100 course offers students the opportunity to explore important ideas and ways of learning while they familiarize themselves with the university setting and make plans for their

education. The course challenges students to become more active learners as they further develop two essential skills for college and life: critical inquiry and oral communication.

CRITICAL INQUIRY: Gather, organize, and evaluate information to produce a well-reasoned analysis that leads to new understandings or questions.

ORAL COMMUNICATION: Deliver clear, focused, well-reasoned speech and critically engage with the speech of others.

COURSE LEARNING OUTCOMES

In addition to the University Learning Outcomes of critical inquiry and oral communication, this course will also focus on the following Course Learning Outcomes. By the end of this course, you should be able to

- Formulate a relevant and falsifiable question about a scientific idea or discovery;
- Distinguish between scientific and pseudo-scientific ideas;
- Roughly describe the evidence and/or reasoning behind foundational ideas in modern astronomy, e.g. how we know seasons are NOT caused by variations in Earth's distance from the Sun.

DISCUSSION GROUP LEADER: Prof. Brian Jackson

Day	Time	Section	Room	Instructor
T	11-11:50 am	D023	MP 301	Jackson
T	1-1:50 pm	D022	MP 301	Jackson
Th	11-11:50 am	D025	MP 301	Jackson
Th	1-1:50 pm	D024	MP 301	Jackson

COURSE MATERIALS

The following materials are required and available at the Boise State Bookstore:

- **Sanders, Matthew L. *Becoming a Learner: Realizing the Opportunity of Education*.** Institute for Communication & Leadership: 2012. (<https://www.amazon.com/Becoming-Learner-Realizing-Opportunity-Education/dp/1467536342/>) This text provides an excellent introduction to a different way of thinking about your education. All UF 100 courses use it in some form. We will read it early in the semester, and the schedule below shows the reading assignments.
- **Jayawardhana, Ray. *Strange New Worlds*.** Princeton University Press: 2013. (Also available on amazon - <https://www.amazon.com/Strange-New-Worlds-Search-Planets/dp/069115807X>). This text provides a brief history of extrasolar planet discoveries and some of the science behind those discoveries. The schedule below shows the reading assignments.

An e-book version is also available for free from the Boise State library - <http://www.boisestate.ebib.com/patron/FullRecord.aspx?p=1114878>.

ADDITIONAL RESOURCES

The following materials are not required but may be helpful:

- **Astronomy**, an open-source, free online textbook - <https://openstax.org/details/books/astronomy>.
- **Exocast**, a regular podcast on exoplanet research - <http://www.exocast.org/>.
- **P.E. Robinson's intro astronomy youtube channel** - <https://www.youtube.com/channel/UCDtnn4Sp8VHm8VqYGFO1E-Q>.

GRADED ASSIGNMENTS

Final grades are based on the following course components:

- Introductions (10 points) -- You are required to schedule a 5-min meeting with Prof. Jackson via e-mail (bjackson@boisestate.edu) before **Sep 27**. These meetings are very informal, and you're welcome to come in groups.
- Syllabus Quiz (10 points total) -- You must read this syllabus and complete a short quiz on Blackboard before 12pm on **Sep 3**.
- In-Class Activities (ICA) (50 points total) -- Most plenary meetings will involve in-class exercises and quizzes, graded pass/fail. Please bring paper and pencil to each class to complete these assignments. In some cases, the quizzes will be to check that you've read the required assignment -- see schedule below. At the end of the semester, the total points will be re-scaled to 50 points.
- Discussion Section Activities (15 Meetings, 20 points each) -- Each discussion section will have some kind of activity, the instructions for which are posted on Blackboard. Please print out a copy of the instructions to bring to the discussion section meeting. ***They will not be provided in the discussion section.***
- Library Badges (20 points) -- The Library Badges serve as an introduction to the Albertsons Library and research skills that will not only help you with your papers and projects but will also help you navigate information used in your personal life and future employment. You will view content and complete tasks in four content areas including the Albertsons Library, strategies for searching, learning how to find quality sources, and evaluating sources. You can find them at <https://guides.boisestate.edu/librarybadges>. When you've completed them, send Prof. Jackson a screencap of your completion certificate (accessible under the "Badges Earned" link on Blackboard). Contact the library for help - librarybadges@boisestate.edu. They will be available on Blackboard on Sep 3 and are due by the beginning of class on **Sep 24**.
- Reading Journals (10 points each) -- We will read two books this semester, Becoming a Learner and Strange New Worlds, and most weeks, you are required to read one chapter from one of the books (but not both) and write a short response on the "Reading Journals" section of the class Blackboard website by **11am on the Tuesday of the week the journal is due**. For example, your response to Ch. 1 of Becoming a Learner is due at 11am on Tuesday, Sep 3.
- Regular Semester Exams (3 exams, 100 points each) -- In-class, closed-book, closed-note, multi-choice using scantron sheets, so bring a #2 pencil.
- Final Project (100 points) -- Discussion sections will break up into three- to four-person groups and prepare a 3-min video presentation about one of the topics discussed in class, to be completed by **midnight on Dec 5**. All members of a group must be in the same discussion section, and groups will be formed during the discussion section meetings in the first two weeks of class. You must tell Prof. Jackson by e-mail who is in your group by **11am on Sep 10** (10 points). A proposal and preliminary bibliography for the project (10 points) is due by **11am on Oct 10**. A rough draft of the video (10 points) is due by **11am on Nov 12**. Additional details are provided in the "Group Project" document on Course Documents page on the Blackboard class website.
- Extra Credit (30 points total): There are a few opportunities to receive extra credit, each worth 3% of your final grade. You can choose two of the following: go to (1) a [Boise Astronomical Society](#) viewing session, (2) the [Discovery Center of Idaho](#), (3) the [Bruneau Sand Dunes Observatory](#) for stargazing, or (4) a [public astronomy event](#), which will take place on Sep 6, Oct 4, & Nov 1 at 7:30pm in the [Education Building](#), room 112. To receive credit, you must e-mail Prof. Jackson an original photo from the event with yourself in view. If you visit the Discovery Center, you must take a photo of yourself in the museum itself, not in the lobby or outside of the museum. Extra credit is due by the start of class on **Dec 12**.

- Observing Labs (20 points each):

There will be two astronomical observing labs during the semester that take place at night, one scheduled Tuesday/Wednesday/Thursday during the weeks of Sep 2 & 9 and the other on Friday, Oct 4.

- Constellation Observing Lab - This lab will involve navigating the night sky and taking an astronomical image. Opportunities to participate in this lab occur 9-11pm on Tuesday, Wednesday, and Thursday evening during the second and third weeks of class, i.e. on the following dates: Sep 3, 4, & 5, and 10, 11, & 12. **Students must sign up for a date before leaving class during the first week of school, i.e. on Aug 27 or 29.**

LA Michelle Szurgot (michelleszurgot@u.boisestate.edu) will host the Tuesday sessions; Prof. Jackson (bjackson@boisestate.edu) will host the Wednesday sessions; and LA Wesley Sandidge (wesleysandidge@u.boisestate.edu) will host the Thursday sessions. Students are responsible for contacting their LA if they will miss the session for which they have signed up. If you sign up for an observing session and don't show up without informing your LA beforehand, you will not receive credit for the lab and will not be allowed to sign up again.

On the evening you've signed up for, you will meet your LA at about 9pm in the Science Building (goo.gl/maps/kMDWWbxzH3A2) and ascend to the observatory on the top of the building. If you have a disability that makes it difficult for you to climb stairs, please contact Prof. Jackson immediately so alternative arrangements can be made. Students are responsible for informing the instructor about the need for other arrangements in advance of the lab. **You cannot climb to the observatory on your own, so please be on time.** You may call the observatory at 208-426-4724, but there's no guarantee that we'll be able to let you in after 9p.

Conditions at the observatory may be windy and cool, especially later in the semester, so dress warmly. If weather prevents you from doing your lab, your grade for this assignment will be exempted. Your LA will e-mail by noon on the day of your scheduled lab to cancel the observing session. If you don't get any e-mails that day, the observing session is on.

- Public Outreach Observing Lab (Oct 4) - This lab will double as a public outreach event, and so members of the Boise State community will join us for stargazing this evening. You are welcome and encouraged to speak with the public about the astronomy you will have learned by this point, explaining how to navigate the night sky. The lab will take place on the top of the Brady Street Parking Garage (goo.gl/maps/3ML8aoZhcYs). As for the previous lab, temperatures may be cool, so dress warmly.

Late Assignments: We need to receive your work on time to provide an equal standard and to be able to give you timely feedback for improvement, and so late assignments will not be accepted but may be excused in extenuating circumstances with the instructor's approval.

Grading Scale (C- or better is required to receive credit for this course)

A grades	100–97%: A+	97–93%: A	93–89.5%: A-
B grades	89.5–87%: B+	87–83%: B	83–79.5%: B-
C grades	79.5–77%: C+	77–73%: C	73–69.5%: C-
D grades	69.5–67%: D+	67–63%: D	63–59%: D-
F grades	59–0%: F		

COURSE SCHEDULE

Date	Topic/Exam	Weekly Discussion/Lab	Reading/Assignments Due
Tue, Aug 27	Welcome	Planning Your Semester	
Thu, Aug 29	Introduction to the Universe		
Tue, Sep 3	Motions of Celestial Objects	Celestial Sphere	Syllabus Quiz; Becoming a Learner, Ch. 1
Thu, Sep 5			
Tue, Sep 10		Lunar Phases	Finalize final project group; BAL, Ch. 2
Thu, Sep 12	The Science and History of Astronomy		
Tue, Sep 17	Exam 1	_Becoming a Learner_	BAL, Ch. 3
Thu, Sep 19	"Harmony of the Worlds"		
Tue, Sep 24	Introduction to the Solar System	Scale of the Solar System	Library Badges; BAL, Ch. 4
Thu, Sep 26			
Tue, Oct 1	Formation of the Solar System	Cosmic Calendar	BAL, Ch. 5
Thu, Oct 3		Activity on Friday this week	
Tue, Oct 8	Exam 2	Half-Life of M&Ms	Project proposal, prelim biblio.
Thu, Oct 10	"The Clean Room"		
Tue, Oct 15	Gravity and Planetary Orbits	Astronomical Spectra	
Thu, Oct 17	Detecting Exoplanets - Direct Imaging and Astrometry		
Tue, Oct 22	Spectra	UF100 Probe Mission	_Strange New Worlds_, Ch. 1
Thu, Oct 24	Detecting Exoplanets - Radial Velocity	No Discussion Section Meetings	
Tue, Oct 29	Detecting Exoplanets - Transits	Extrasolar Planet Radial Velocities	SNW, Ch. 2
Thu, Oct 31	Exam review/Final project consultation		
Tue, Nov 5	Exam 3	Detecting Exoplanets Simulation	SNW, Ch. 3
Thu, Nov 7	"Some of the Things That Molecules Do"		
Tue, Nov 12	Origin and History of Earth Life	Comp. Sim. Greenhouse Effect	SNW, Ch. 4; Outline of final project
Thu, Nov 14			
Tue, Nov 19	Planetary Habitability	The Habitable Zone	SNW, Ch. 5
Thu, Nov 21			
Tue, Nov 26	THANKSGIVING BREAK		
Thu, Nov 28	THANKSGIVING BREAK		
Tue, Dec 3	Finding Extraterrestrials	The Drake Equation & Fermi Paradox	SNW, Ch. 8
Thu, Dec 5			Final project - Dec 5
Tue, Dec 10	Group Project Presentations	Reviewing Your Semester	SNW, Ch. 9
Thu, Dec 12	Group Project Presentations		
Thu, Dec 19	NO FINAL EXAM - Have a good break!		

COURSE EXPECTATIONS

Boise State University expects everyone to uphold the Boise State University [Statement of Shared Values](#), which includes the following:

Academic Excellence • Caring • Citizenship • Fairness • Respect • Responsibility • Trustworthiness

Building these values into our behavior creates an ideal space for learning, where we can all feel comfortable engaging with challenging tasks and ideas. In addition, you are expected to be familiar with the standards outlined in the Boise State University [Student Code of Conduct](#). If you have concerns about the Shared Values or see anyone in class, including your instructor, struggling to uphold them, you are encouraged to share your concerns. My goal as a teacher is to provide you with effective tools and space to think critically about issues that affect everyone as students, citizens, and humans. **You can succeed in this course!**

EXPECTATIONS FOR INSTRUCTORS

Here are some things you can expect from me to help you be successful:

Prepare for class / Actively participate in class

- I will teach using different tools and methods to respect the diversity of learning styles;
- I will present significant questions and different responses to those questions, but I will not present the "right answer" to the big questions of the course;
- I will endeavor to respond to all student inquiries promptly. Note that any arrangements made regarding the class (e.g., rescheduling assignment due dates) must be documented via e-mail, even if we discuss an arrangement in-person. *If there is no e-mail exchange documenting the arrangement, I didn't agree to it!*

Respect students and the community

- I will encourage any perspective about the questions raised in our course that can be reasonably defended with evidence;
- I will appreciate the diversity in the subject of this course as well as in our classroom community and endeavor to promote inclusivity in the spirit of our [Statement of Diversity and Inclusivity](#);
- I will always be open to and encourage constructive conversation about how we can make our collective experience better.

EXPECTATIONS FOR STUDENTS

Here are similar things expected from you:

Prepare for class

- Check our Blackboard course website and your Boise State e-mail account regularly. Come to class having completed the readings and any required assignments;
- Expect to spend 6–7 hours per week outside of class on readings and coursework;
- Academic Integrity is a critical part of the value of Academic Excellence. Upholding academic integrity in all work provides you with the opportunity to fully engage with the material being investigated and clearly assert your evidence-based findings. For that reason, all your submitted work should represent your current ideas and efforts or be cited (including any material from another course); otherwise, the action constitutes academic dishonesty, which will result in grade penalties, failure in the course, or dismissal from the Program and/or the University. See the Boise State University [Student Code of Conduct](#) and [academic integrity](#) page for more details. *Collaboration is allowed (and encouraged) for all group assignments;*
- When emailing faculty, please put the class name and a brief description in the subject line. (Example: UF 100 Digital Project). Start your e-mail with a greeting, be respectful and clear, and end with your name.

Actively participate in class

- Answering questions, complete in-class assignments, and contribute to group discussions and projects. Unless an absence is approved, missed in-class assignments cannot be made up;
- You should arrive on time and stay through class;
- Absences: You are responsible for attending classes and making up work from missed classes, whether your absence is [university-approved](#). There are really no [“excused” absences](#). For a university-approved absence, you should provide a formal letter from the appropriate authority prior to the absence. If you have a question regarding an absence, please discuss it with the instructor;
- Phones and electronic devices: Minimizing distractions is very important in the classroom. Unless you're specifically asked to use them, please put away laptops and phones when our class begins;
- Students needing accommodations should contact the [Educational Access Center \(Lincoln Garage, 208-426-1583\)](#). All accommodations must be approved prior to being implemented. One of the course assignments involves climbing stairs to the campus observatory. Please let your instructor know immediately if you have difficulty climbing stairs so other arrangements can be made.

Respect each other and the community

This class, like this university, is a community. Communities contain diverse identities and perspectives, and the most successful communities respect that diversity as a key to collective improvement. In alignment with the Boise State University [statement of diversity and inclusivity](#), all community members are encouraged to contribute their perspectives and experiences. We encourage you to enrich yourself and the community by listening to others and sharing your thoughts. If you feel isolated from our classroom community in some way, please let your instructor know so that we can work together to create a welcoming space for you to feel like part of the community.

EDUCATIONAL ACCESS CENTER

[Lincoln Garage](#), Phone: (208) 426-1583

Students needing accommodations to fully participate in this class should contact the Educational Access Center (EAC). All accommodations must be approved through the EAC prior to being implemented. Visit the EAC's website at <https://eac.boisestate.edu/new-eac-students/>.