NAU NORTHERN ARIZONA UNIVERSITY

College of the Environment,
Forestry, and Natural Sciences

Department of Astronomy and Planetary Science
AST 496C — Capstone Experience in Astronomy
Fall 2022

Course Information

- Meeting Times & Location: MWF 12:40 — 1:30 pm, Phy. Sci., Rm 218
- Credit: 3 credit hours
- Instructor & Email: Dr. Lisa Chien
- Email: Lisa.Chien@nau.edu
- Office Location: Blgd. 19, Rm. 311
- Office Hours: MW 11:00 am — 12:00 pm

Course Prerequisites

AST 280, (AST 333W or PHY 333W), and Senior Status

Course Description, Objectives, & Structure

This course is the culmination of the undergraduate program in the Department of Astronomy and Planetary Science. It aims to catalyze the transformation of senior students from classroom learners to active independent professionals. It will also introduce students to the full range of academic and professional career options in the fields of astronomy and planetary science. Students will learn valuable skills that are required for successful careers in either academia or industry. These NACE Career Readiness Competencies that this course will focus on are ***Career & Self-Development, Communication, Critical Thinking, Professionalism,*** with a little enhancement in *Teamwork,* and *Equity & Inclusion*. Students will participate in various discussions, trainings, and activities that are strategically designed to boost these skills, and work directly with NAU Career Development professionals. The topics also include academic career options, professional resume and statements, grad school and/or job applications, science communication skills, conference and networking skills, presentations, grant proposals, and interview skills. Oral and written presentations, as well as mock interviews will be required in this class. AST 496C currently fulfills the Liberal Studies Essential Skills of **Critical Thinking, Effective Writing, Oral Communication,** and **Scientific Inquiry.**

NACE Career-Ready Competencies

National Association of Colleges and Employers (NACE) defined eight Career Readiness Competencies that are key to ensuring successful entrance into the workforce and lifelong career management. They are:

1. **Career & Self-Development**: Proactively develop oneself and one's career through continual personal and professional learning, awareness of one's strengths and weaknesses, navigation of career opportunities, and networking to build relationships within and without one's organization.
2. **Communication**: Clearly and effectively exchange information, ideas, facts, and perspectives with persons inside and outside of an organization.
3. **Critical Thinking**: Identify and respond to needs based upon an understanding of situational context and logical analysis of relevant information.
4. **Equity & Inclusion**: Demonstrate the awareness, attitude, knowledge, and skills required to equitably engage and include people from different local and global cultures. Engage in anti-racist practices that actively challenge the systems, structures, and policies of racism.
5. **Leadership**: Recognize and capitalize on personal and team strengths to achieve organizational goals.

6. **Professionalism**: Knowing work environments differ greatly, understand and demonstrate effective work habits, and act in the interest of the larger community and workplace.
7. **Teamwork**: Build and maintain collaborative relationships to work effectively toward common goals, while appreciating diverse viewpoints and shared responsibilities.
8. **Technology**: Understand and leverage technologies ethically to enhance efficiencies, complete tasks, and accomplish goals.

Student Learning Outcomes that demonstrate the achievements of the competencies and skills to:

SLO1. Self-explore career goals and learn how to plan career paths and find desired jobs *(Career & Self-Development)*;

SLO2. Write professional resumes and statements to clearly demonstrate skillsets, achievements, and plans *(Communication)*;

SLO3. Be aware of bias and lack of diversity in the field, through group activities, and demonstrate critical ideas/actions for future improvements *(Equity & Inclusion, Teamwork, Critical Thinking)*

SLO4. Clearly present scientific results, through a small research project, in oral, written, and visual formats appropriate for scientific and non-scientific audiences *(Communication, Critical Thinking, Technology)*;

SLO5. Demonstrate professionalism and engagement, through other class activities and mock interviews, in all interactions as well as a positive and mature disposition. *(Professionalism)*

Required Materials & Technology

Weekly reading materials and assignments will be provided to students via BbLearn.

Expectations, Assessments, & Grading System

Assessment	Total Points
Career Development Udemy lessons (8 x 1pt)	**8**
Grad School or Job search package (5pt)	**5**
Written assignments: Cover Letter (1pt) CV/Resume (5pt) Statement (5pt) Conference Title & Abstract (1pt) Slides or Poster (5pt)	**17**
Total	**30**

Classes Missed	Effect on Grade
≤ 2	None
3 — 4	Reduce 5%
≥ 5	Reduce 10%

Grade	Points
A	27 — 30
B	24 — 26
C	21 — 23
D	18 — 20
F	0 — 17

Official policies: University Policies, Academic Integrity Policy, Student Institutional Excuses Policy.

Respect for Diversity and Inclusion

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you. I am NAU SafeZone certified.

Tentative Schedule

Wk	Mon	Wed	Fri	Discussion Topics & Content	Reading/ Watching	Assignments
1	8/29	8/31	9/2	**Course introduction & Career Development (CD) Program Overview:** Resources	* Competencies for a Career-Ready Workforce (NACE, 2021) * Walkowicz (2018)	**1)** 21st century workplace- Managing your career **2)** Knowing yourself and others- Establishing your professional identity
2	-	9/7	9/9	**Academic career options- Grad School:** Programs, schools, advisors, fellowships, requirements (Fee, GRE, Transcript, statement)	* Guide to Graduate School (Astrobites) * CD Graduate School Worksheet	**3)** Complete graduate school search sheet for 3-5 schools **OR 3)* below**
3	9/12	9/14	9/16: LinkedIn session, I	**Academic career options- Teaching & Education:** Teaching positions, Astronomy Education Research **Other career options:** Science communication/policy, outreach, telescope operator, industries, & companies, NASA, Space Force	* What Can I Do With This Major? * Careers In Astronomy: What am I Doing with my Life?? (2011) * Career Guidance (JPL) * Webinars with Alaina G Levine for job seekers (AAS) playlist * How I switched from academia to science communication (Nature, 2019)	**4)** Explore through experience- Designing career experiments **5)** Networking & relationship building- Building your personal brand **6)** Job search strategies- Identifying the right job(s) for you **3)*** Complete job search sheet for 3 jobs
4	9/19	9/21	9/23	**Professional resume**: Cover letter & CV	* Industry Resume guide for PhDs * Action verbs for resumes * CD Resume Checklist + Transferable Skills * Impact CV	**7)** Developing application materials- Crafting your resume content **8)** Cover letter (to BBLearn position) **9)** CV/Resume (CD Resume Dropbox OR Resume Review Appointment)
5	9/26	9/28	9/30: Career & Grad School Expo	**Professional statement:** Statement of Purpose, Teaching statement, Diversity statement LaTex (Overleaf, Typeset)	* Statement of purpose advices * LaTex Cheatsheet	**10)** Statement (Assignment 3 due)
6	10/3	10/5	10/7*	**EDIJ in STEM field:** Status, implicit biases tests, trainings, opportunities	* Why So Few? AAUW (2010) * Bullying and harassment are rife in astronomy, poll suggests (Nature, 2021) * 10 Tips for Women Students in Science Fields (2010)	**11)** Thriving in the workplace- Building & maintaining workplace relationships (Assignment 9 due)
7	10/10*	10/12	10/14*	**Stress & Time Management:** Exercises, strategies, SMART goals, IMPROVE the moment	* SMART Goal * Confronting Failure: Approaches to building confidence and resilience in undergraduate researchers (eBook)	**12)** Professional skills- Communicating in workplace
8	10/17	10/19🗣️	10/21: LinkedIn session, II	**Science communications:** Public speaking, improv, elevator/3-minute speech **Elevator speech practice**	* Improv Helps Ph.D.'s Explain Their Work–and Loosen Up (2014) * Making the Most of your 3 Minutes * NAU 3MRP	(Assignment 10 draft due)
9	10/24🗣️	10/26+	10/28*	**Professional conferences:** Title, abstract, poster, slides, oral presentations	* Doing Science: Writing conference abstracts (2014) * Abstract guidelines for papers (2022) * UGRADS Poster and Presentation Tips (2021)	**13)** Conference title & abstract
10	10/31	11/2	11/4*	**Networking skills:** Make the best out of your conference experiences	* Assertion-Evidence presentations * How to give a good presentation (CUR)	**14)** Slides OR a poster
11	11/7	11/9	-	**Grant proposals:** Research, EPO, telescope, effective practices	* How to find, read and organize papers (Nature, 2022) * How to write an Outreach grant proposal (2006)	(Assignment 14 due)
12	11/14	11/16🗣️	11/18🗣️	**Presentations**		
13	11/21	11/23	-	**Interview skills:** Preparation, tips, the STAR method	* Behavioral-based Interview Questions * CD Tips + Worksheet + Cheat Sheet	• Interview skills- Sub lessons (optional) • The Hiring process- sub lessons (optional)
14	11/28🗣️	11/30📊	12/2🗣️	**Presentations, cont. & Mock interviews**		
15	12/5📊	12/7🍕	12/9📊	**Mock interviews, cont.** & Pizza party		(Assignment 10 due)

*Alumni chat +Flagstaff Astronomy Symposium