

Department of Astronomy and Planetary Science

AST 496C — Capstone Experience in Astronomy

Fall 2024

Course Information

- Meeting Times & Location: MWF 12:40 — 1:30 pm, Biological Sciences (Bldg 21) 224
- Credit: 3 credit hours
- Instructor & Email: Dr. Mark Loeffler
- Email: mark.loeffler@nau.edu
- Office Location: Bldg. 19, Rm. 311
 - Office Hours: M 11:00 am — 12:00 pm or by appointment (anytime) – **feel free to just stop by anytime**

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 skill sets, 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 Canvas.

Assessments & Grading System

Assessment	Points	Absence	Effect on Grade	Grade	Points
Career Development UdeMy Lessons	8	≤ 2	None	A	26 – 30
Graduate School or Job Search Sheet	5	3 – 4	Reduce 5%	B	23 – 25
Cover Letter	1	≥ 5	Reduce 10%	C	20 – 22
CV/Resume	5			D	17 – 19
Personal Statement	5			F	0 – 16
Conference Title & Abstract	1				
Slides or Poster	5				
Total	30				

Official policies: [University Policies](#), [Academic Integrity Policy](#), [Student Institutional Excuses Policy](#).

Tentative Schedule (Check Canvas for Latest Schedule)

Wk	Mon	Wed	Fri	Discussion Topics & Content	Assignments
1	8/26	8/28	8/30	Course introduction & NAU Career Development Program Overview: Resources	<ul style="list-style-type: none"> • 21st century workplace: Managing your career • Knowing yourself and others: Establishing your professional identity
2	-	9/4	9/6	Academic career options- Grad School & Post-Bacs: Programs, schools, advisors, fellowships, requirements (Fee, GRE, Transcript, statement)	Graduate School Search sheet for 3-5 schools OR Job Search Sheet for 3-5 jobs Due in 2 weeks
3	9/09	9/11	9/13	Academic career options- Teaching & Education: Teaching positions, Astronomy Education Research Interns & other career options: Science communication/policy, outreach, telescope operator, industries, & companies, NASA, Space Force	<ul style="list-style-type: none"> • Explore through experience: Designing career experiments • Job search strategies: Identifying the right job(s) for you
4	9/16	9/18	9/20	Professional Resume: Cover letter & CV	<ul style="list-style-type: none"> • Developing application materials: Crafting your resume content • Cover letter (to Canvas position) Due in 1 week • CV/Resume Due in 2 weeks
5	9/23	9/25	9/27	Personal Statement: Statement of Purpose, Teaching statement, Diversity statement LaTeX (<u>Overleaf</u> , <u>Typeset</u>)	<ul style="list-style-type: none"> • Personal Statement Draft due in 3 weeks
6	9/30	10/2	10/4	EDIJ in STEM field: Status, implicit biases tests, trainings, opportunities	<ul style="list-style-type: none"> • Thriving in the workplace: Building & maintaining workplace relationships
7	10/7	10/9	10/11	Stress & Time Management: Exercises, strategies, SMART goals, IMPROVE the moment	<ul style="list-style-type: none"> • Professional skills: Communicating in workplace
8	10/14	10/16	10/18	Science Communications: Public speaking, improv, elevator/3-minute speech Elevator speech practice, I	<ul style="list-style-type: none"> • Networking & relationship building: Building your personal brand
9	10/21	10/23	10/25	Professional conferences: Title, abstract, poster, slides, oral presentations Elevator speech practice, II	<ul style="list-style-type: none"> • Conference title & abstract Due in 1 week
10	10/28	10/30	11/1	Networking skills: Make the best out of your conference experiences	<ul style="list-style-type: none"> • Slides OR poster Due in 1.5 week
11	11/4	11/6	11/8	Town Hall Meetings: Bring your questions to our grad students and professors!	
12	-	11/13	11/15	Presentations	
13	11/18	11/20	11/22	Interview skills: Preparation, tips, the STAR method; Mock interviews	<ul style="list-style-type: none"> • Interview skills- Sub lessons (optional) • The Hiring process- sub lessons (optional)
14	11/25	-	-	Mock interviews	
15	12/2	12/4	12/6	Course wrap up and pizza party!	

* There will be Career Development workshops, Alumni Chat sessions, and a date for Flagstaff Astronomy Symposium