

## **ENVS 498A Undergraduate Research Capstone**

**Sections: 201**

**2 Credit Course | 7.5 Weeks**

Asynchronous

<https://d2l.arizona.edu/d2l/home/1200242>

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[Download the Syllabus](#)

### **Description of Course**

Undergraduate Research Capstone (ENVS 498A & B) aims to expand student experiential learning, enhance research capabilities, prepare students for real-world careers, and increase the diversity of graduating students qualified for data-driven jobs. ENVS 498A offers an immersive and hands-on exploration of various aspects related to water quality, combining theoretical knowledge with practical research techniques. Through immersive Virtual and Augmented Realities, lectures, and independent research, students will develop a comprehensive understanding of field sampling techniques, instruments, and real-time data collection of water values and amounts without going into the field. Understanding how to monitor and report on water availability and suitability indicators is the first step in protecting, conserving, and restoring water resources.

### **Course Prerequisites or Corequisites**

The prerequisites for this course are ENVS 408 and ENVS 480.

### **Course Instructor and Contact Information**

Name: Jacqueline Maximillian, Ph.D.

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Email: [maximillianj@arizona.edu](mailto:maximillianj@arizona.edu)

## Expected Course Learning Outcomes (CLOs)

*Upon completing this course, you will be able to do the following:*

1. **Foundation Knowledge:** Differentiate between the critical water quality parameters the United States Geological Survey monitors, their environmental thresholds, influencing factors, instruments, and procedures for sampling and collecting water quality. parameters. **[PLO #1] (Observed, Quiz)**
2. **Data Literacy and Analytical Skills:** Extract a water quality dataset from the National Water Dashboard, describe its dimensions, and address missing data values. **[PLO #2] [Observed: Research Plan]**
3. **Research Skills:** Create a research plan by formulating an actionable research question and hypothesis, identifying key concepts and keywords, developing a search strategy for relevant and credible sources, and extracting data from government sources. **[PLO#2] [Observed: Research Plan]**
4. **Strategic Communication Skills:** Defend a research plan by preparing a three-minute science pitch and applying persuasive techniques to garner support or funding from decision-makers. **[PLO#3] [Assessed: Science Pith]**
5. **Reasoning and Critical Thinking Skills:** Make decisions on the performance indicators through pre and post self-assessments and peer evaluation. **[PLO#4] [Observed: Pre and Post Self-Assessment]**

## Required Readings

Supplied by the instructor.

## Required or Special Materials

### ***Minimum System Requirements***

To work optimally, Your computer and browser must meet minimum requirements for D2L, Adobe Connect, and other systems. See UA [Minimum System Requirements](#).

### ***Reliable Internet Connection***

This is a comprehensive web-based search course where you will access various government databases, applications, and interphases in search of qualitative and quantitative data.

### **Course Communications**

There are four types of communication: general, private, announcement, and email.

#### ***General Communication***

This involves course materials' accessibility, clarity of instructions and assignments, and any question or comment that is okay for other students to see and benefit from the response or be able to respond. Submit all your questions about the course in D2L under the "General Communication" located under the 'Discussions' tab. If you have a course question, check the "General Course Communication" to see if anyone has asked or responded to the same question or concern.

#### ***Private Communication:***

This involves student-specific questions, absences from class, concerns, or requests. Please communicate through the "**Private Course Communication.**" Only the members of the instruction team can see the post.

#### ***Announcement Communication***

This involves posting information on the announcement page on D2L. Please check the announcements page before each class.

#### ***Email Communication:***

When you email an instructor, write the complete course code in the subject box, e.g., ENVS 498A. Only send me an email if I receive many emails, and yours might get buried, thus delaying a response, and it is easier to keep records.

**Some guidelines before you post or e-mail.** Refer to the course syllabus, General Course Communication assignment sheets, or Announcement page on D2L; you may already have what you need.

If you skipped class, do not ask your professor what you missed; ask your classmates!

This is how you can access your classmates' emails:

On the navigation bar, click *Classlist*.

- Select the checkboxes beside the users you want to contact on the All tab. Click on "Send Email."
- Enter your message. To add an attachment to your email, click Browse.
- Click Send

### ***Response Time.***

I will respond to "Course and private communication" postings within 24 hours, regardless of whether it is a weekday or weekend. However, I will respond to all emails and voicemails within 24 hours on weekdays and 48 hours on weekends. If you do not hear from me after 24 or 48 hours, try another means of communication.

### **Course Assessment Plan**

The course will use Interactive Lectures, Research Reports, Peer Reviews, and Professional Development to assess your learning. A summary of each assignment category is provided below, and the details of the individual assignments are available on D2L.

#### **Padlet (10% of the final grade)**

#### **Lectures (40% of the final grade)**

These are 10 to 25-minute lectures embedded with quiz questions and learning activities. The learning activities are designed to engage you in learning and test your understanding. The lectures are recorded YouTube Videos, and I used Playposit to make them interactive. Others are virtual reality immersion.

#### **Research Entries (36% of the final grade)**

are different steps: researching, proposing, writing, and defending your proposal and findings. In ENVS 498A, you will write three entries. Entry 1: Research Plan, 2: Introduction, and 3: Science Pitch.

### **Assessment (24% of the final grade):**

Under this assignment category, students evaluate themselves and each other through diagnostic tests and summative peer evaluation. Under diagnostic tests, each student's knowledge, skills, and abilities on water parameters, measurements, some elements of research, and module learning outcomes. In summative peer evaluation, students will evaluate the final course product using the Summative Peer Evaluation Form. The form contains established performance criteria and a rating scale. Peer evaluation allows students to demonstrate knowledge of a subject (scientific writing) while building desirable soft skills, such as self-evaluation, reflection, and critical analysis.

## **3.2 Grading Scale and Policies**

This section explains the evaluation methods and how the final grade will be calculated, including components/assignments, weightings, evaluation criteria, explanations of how late work will be graded, and a description of extra-credit opportunities.

### **Assignment Weighting**

The class has a total of 250 points. The distribution of each assignment is shown in Table 2.

**Table 2** *Assignments Weight Toward the Final Grade*

| Assignment                             | Possible Points | Percentage |
|----------------------------------------|-----------------|------------|
| Knowing Each Other                     | 20              | 10         |
| Lectures and Quizzes                   | 100             | 40         |
| Assessment (3 assessments @ 20 points) | 60              | 25         |

|                                 |            |            |
|---------------------------------|------------|------------|
| Entries (3 Entries @ 20 points) | 60         | 25         |
| <b>Total</b>                    | <b>240</b> | <b>100</b> |

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## Grades and the Grading System

The final grade will be based on A, B, C, D, and E, constituting the regular grades used at the University of Arizona. Grades will be assigned: A: 90 – 100 B: 80 - 89 C: 70 – 79 D: 60 – 69 E: 59 and below—UArizona standard; no rounding up. University policy regarding grades and grading systems is available at [this site](#). You MUST do all the assignments to increase your chances of earning an A. In D2L, there are two ways to set up a "Final Calculated Grade."

1. Drop ungraded items
2. Treat ungraded items as 0.

In the first method, you start with 100% (full cup), which means you will have 100% even if you still need to complete the assignments. You start with a full cup and empty it with time. The second method begins with 0% (empty cup) and adds points as you complete the course content. Therefore, you start with an empty cup and fill it with time. Some instructors use the full-cup, and others the empty-cup method. For this course, I use the second method: I start with an empty cup. Each method has its pros and cons.

## Final Examination or Project

The Science Pich is due on October 01 at 11:59 pm. Please visit the University of Arizona's [Final Exam Regulations](#) and [Final Exam Schedule](#) for information on regulations and schedules.

## Scheduled Topics/Activities

Table 1 shows the topics and the assignments due each week. The specific due dates for each assignment are available in the Checklist in D2L. It is essential to follow the deadline to make grading efficient and effective. Please plan.

**Table 1** Topics, Assignments, and Due Dates

| Date                                                           | Topic and Assignment |
|----------------------------------------------------------------|----------------------|
| August 21 – 27   Week 1   Module 1: Introduction to the Course |                      |

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**Assessment 1:** Pre-Diagnostic Test

Padlet: Knowing Each Other

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**August 28 - September 03 | WEEK 2 | [Module 2: Surface Water Resources](#)**

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**Quiz 1:** Scenes 1 & 2 Importance of Groundwater Discharge

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**September 04 - September 10 | WEEK 3 | [Module 3: Streamflow or Discharge](#)**

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**Quiz 2:** Scene 3: Surface Water Monitoring

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**Quiz 3:** Scene 4: Streamflow or Discharge Measurement

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**September 11 - September 17 | WEEK 4 | [Module 4: Physicochemical Water Quality Parameters](#)**

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**Quiz 3:** Scene 5: Physicochemical Water Quality Parameters

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**Quiz 4:** Scene 6: USGS Gaging Station or Sensors

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**September 18 - September 24 | WEEK 5 | [Module 5: Research Dataset and Hypothesis](#)**

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**Entry 1:** Research Plan

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**September 25 - October 01 | WEEK 6 | [Module 6: Introduction](#)**

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**Entry 2:** Introduction Section

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**October 01 - October 08 | WEEK 7 | [Module 7: Science Pitch](#)**

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**Entry 3:** Science Pitch

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**October 09 - October 11 | WEEK 8 | [Module 8: Summative Peer Evaluation](#)**

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**Assessment 2:** Science Pitch Peer Evaluation

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**Assessment 3:** Post-Diagnostic Test

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## **Student Success Resources**

### **UA Academic Policies**

The University of Arizona has policies and procedures for student success, including withdrawing from the course and university, change of schedule, class attendance, participation, academic petitions, academic integrity, etc. The list of policies and procedures is available at <https://catalog.arizona.edu/policies>.

### **Academic Advising**

If you have questions about your academic progress this semester, please contact your academic advisor (<https://advising.arizona.edu/advisors/major>). Contact the Advising Resource Center (<https://advising.arizona.edu/>) for all general advising questions and referral assistance. Call 520-626-8667 or email [advising@.arizona.edu](mailto:advising@.arizona.edu)

### **Code of Academic Integrity**

A student is encouraged to freely share intellectual views and discuss the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students must adhere to the UA Code of Academic Integrity described in the UA General Catalog. The University Libraries have some excellent tips for avoiding plagiarism.

Selling class notes and other course materials to other students or a third party for resale is prohibited without the instructor's written consent. Violations of this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

### **Life Challenges**

If you are experiencing unexpected barriers to your course success, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at (520) 621-2057 or [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu).

### **Physical and Mental-Health Challenges**

If you face physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. Counseling and Psych Services (CAPS) information is available at <https://caps.arizona.edu>. For medical appointments, call (520) 621-9202. For After, Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

Other student support resources: <https://academicaffairs.arizona.edu/syllabus-policies>

### **Administrative Drop/Reinstatement**

Maintaining a grade above 60% is required in this course. I will provide grade checkpoints. You will receive a notification informing you of your grade status and allowing you to devise a plan to raise your grade. For more information about the administrative drop, [visit this website](#).

### **Course Policies**

While UA Policies apply to all courses, most courses have some-specific policies. This segment differentiates between policies about course progress and completion and classroom climate and community engagement.

### **Makeup Policy for Students Who Register Late**

If you registered late, contact the instructor to complete the assignments. You will have one week to catch up with the rest of the class.

### **Absence and Class Participation Policy**

Participating in the course and attending lectures and other events are vital to learning. As such, attendance is required at all lectures and discussion section meetings. Absences may affect a student's final course grade. If you anticipate being absent, are unexpectedly absent, or are unable to participate in class online activities, please contact me as soon as possible. To request a disability-related accommodation to this attendance policy, please contact the Disability Resource Center at (520) 621-3268 or [drc-info@email.arizona.edu](mailto:drc-info@email.arizona.edu). If you are experiencing unexpected barriers to your course success, the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office is in the Robert L. Nugent Building, room 100, or call 520-621-7057. UA's Class Attendance and Participation and Administrative Drops policy are available [here](#).

The UA policy regarding absences for any sincerely held religious belief, observance, or practice will be accommodated where reasonable. For details, go to [Religious Accommodation Policy](#). Other absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored, for details of the absences see the Dean of Students Office [Attendance Policies and Practices](#).

### **Due Dates**

Due dates for each assignment are published on the course "Checklist and appear in the calendar. Work turned in by 11:59 PM Mountain Time on the due date, as evidenced by the date stamp given on the submission folder in D2L, will be considered on time and will receive full credit. Prompt submission of assignments for assessment allows the instructor to provide guidance and timely feedback. Assignment grades will be posted in the grade book seven days after the assignment's due date.

### **Late Submissions and Revisions Policy**

All coursework (including, but not limited to: assignments, reading quizzes, and final projects) must be submitted by the due date unless prior arrangements are made with the instructor or grader and a new due date is established. If a student submits an assignment after the due date without arranging it with the instructor, a minimum of 10% of the grade will be deducted. In other words, late work will be accepted if submitted within 72 hours of the original due date but will be docked 10%.

- Students with documented evidence of an emergency, which prevented prior communication with the instructor, may present documentation to the instructor or grader for consideration. Coursework will only be accepted after the last day of the term if arranged as part of a Course Extension. *Email the instructor or an assigned TA your excuse before the assignment's due date.*

### **Incomplete (I) or Withdrawal (W)**

Requests for incomplete (I) or withdrawal (W) must be made following University policies. The policies are available at <http://catalog.arizona.edu/policy/grades-and-grading- system#incomplete> for incomplete and <http://catalog.arizona.edu/policy/grades-and-grading- system#Withdrawal> for withdrawal.

### **Dispute of Grade Policy**

If you are unsatisfied with a grade you received on an assignment, please email or call the instructor within three days. Check the grade book throughout the course to review assignment feedback. If you have questions or concerns about a grade, please contact the instructor ASAP. Be sure to discuss missing assignments or grades in the grade book before final grades are posted.

### **Classroom Climate and Community Engagement**

#### **UA Policies and Student Resources**

All UA courses adhere to the general UA Policies stated on the institutional websites: <https://academicaffairs.arizona.edu/syllabus-policies>. Please familiarize yourself with the Student Code of Academic Integrity and the protocol ensuring non-discriminatory, anti-harassment, and non-threatening learning experiences. This site also includes a list of student resources. The entirety of University Policies can be found here: <https://catalog.arizona.edu/policies>.

### **Accessibility and Accommodations**

At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, <https://drc.arizona.edu/>) to establish reasonable accommodations.

### **Course Climate and Inclusion Statement**

The University is committed to creating and maintaining an environment free of discrimination. See the [anti-harassment policy here](#).

In our classroom, everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without bullying or discrimination against others.

### **Use of Devices for Learning**

Because instructors may be curious about what their students are doing on their devices, electronic devices might be a barrier between the instructor and the student. At the same time, students who struggle with invisible disabilities like dyslexia, ADHD, or vision problems utilize computers to take notes and access cloud-based assistive solutions.

Additionally, the course uses Excel, and students access course materials and resources for your class via Brightspace. Therefore, laptops and other electronic devices are allowed in the classroom. The expectation is that the students will use the device responsibly.

### **Confidentiality of Student Records**

The Family Educational Rights and Privacy Act of 1974, commonly referred to as FERPA or the Buckley Amendment, is a federal law designed to protect the privacy of a student's education record. Student records are kept confidential as per the [FERPA policy](#).

### **Subject to Change Statement**

Information in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor. For more information on the syllabus, go to [Course Syllabus Policy](#).