

# FYEX 100: First Year Seminar

## Chemistry in Color

### Fall 2024

**Instructor:** Melissa A. Mullen Davis, Ph.D.  
**Pronouns:** she/her/hers  
**Office:** 218 Caputo Hall  
**Office Phone:** 717-871-7439  
**e-mail:** [melissa.mullevdavis@millersville.edu](mailto:melissa.mullevdavis@millersville.edu)  
**Office Hours:** Mon 11am – 1 pm, Wed 1 pm – 3 pm, Fri 12:30 pm – 1:30 pm, and by appointment

**Peer Mentor:** Tim Lerch  
**Email:** [tglcrch@millersville.edu](mailto:tglcrch@millersville.edu)  
**Peer Learning Hours:** Tues 5:00 – 7:00 pm in Roddy 256

**Class Meetings:** MWF 10-10:50 in Roddy 258

**Credit:** 3 credits. There are 3 class hours per week.

#### What do you need for this class? You will need:

- Scientific, non-graphing calculator which must be able to handle logarithms (log, ln) and exponents ( $10^x$ ,  $e^x$ ,  $y^x$ )
- A white, cotton t-shirt (or other white cotton item; can have writing on it) for t-shirt chromatography
- Regular access to D2L (<https://millersville.desire2learn.com>) and university email.
- Other readings and resources will be available on D2L.

#### Course Overview:

We live in a colorful world! From traffic lights to rainbows, color is embedded in our everyday lives. This course will examine the chemistry of color and colorful chemical reactions. We will discuss properties of light and color and learn what makes some objects glow. We will also consider natural and synthetic pigments and how they are affected by environmental conditions. This course does not have a laboratory component, but some hands-on activities will be incorporated.

#### Cornerstone FYEX Student Learning Outcomes

By the end of the course, you will:

- (1) Demonstrate autonomy and competence in planning for personal and academic goals.
- (2) Identify resources and practice strategies to support personal and academic success.
- (3) Develop effective communication skills, critical thinking skills and dispositions, and information literacy skills to explore academic content.
- (4) Recognize the value of diverse perspectives as a citizen of the university community.

#### Course Objectives

By the end of the course, you will:

- 1) Identify properties of matter and light that contribute to the electromagnetic spectrum.
- 2) Describe how different elements behave and how atoms combine and rearrange to form compounds that can contribute to visible color.

- 3) Describe how environmental conditions affect properties of different compounds.
- 4) Identify analytical methods that can be used to analyze pigments and dyes.
- 5) Apply the scientific method to an investigation of pigment stability.

### Course Organization

We will address the goals of the course by exploring different aspects of the chemistry of color and using our time to talk about chemistry and other topics relevant to the transition to college. Within each module, topics will be organized to address an overarching topic or question. The modules are listed below along with the chemistry to be covered in each. These might change as the semester goes on. Any changes will be mentioned in class and will be listed on D2L.

<p>Module 1: What is your favorite color?  <i>Color in our lives, Electromagnetic spectrum, absorbance and transmittance, measurement, refraction and diffraction, physical changes, changes of state</i></p>
<p>Module 2: Why does white glow under black light?  <i>Atoms, valence electrons, luminescence, fluorescence, energy</i></p>
<p>Module 3: Where do fireworks get their pretty colors?  <i>Periodic table, elements, ions, ionic compounds, covalent compounds, chemical reactions, combustion, fireworks</i></p>
<p>Module 4: Pigments and Dyes  <i>Organic molecules, functional groups, double bonds, absorbance, solubility and extraction, natural vs synthetic, materials</i></p>
<p>Module 5: Why can hydrangea flowers change colors?  <i>Acid-base chemistry, concentration, moles, pH, indicators, neutralization reactions</i></p>

While learning about chemistry of color we will also focus on topics that will set you up for success during your time and studies at Millersville! These include (but are not limited to) the topics listed below.

#### Important for Success on Campus:

- Understanding academic life: the syllabus and communicating with faculty
- Academic advising and planning your program
- Campus safety strategies and Title IX
- The University College and student support services

#### Important for your future career and life:

- Time management
- Stress management and mental health awareness
- Diversity, equity, and inclusion training
- Money management and financial aid/financial literacy

## Succeeding in Chemistry Class!

I promise to provide you with the resources you need to help you succeed in Chemistry and at Millersville with resources, class materials, examples, readings, practice problems, office hours, etc. but *you are ultimately responsible* for the knowledge you are gaining.

To do well in this class, it is important to:

- 1) Keep up with the material. I recommend keeping a schedule and working on Chemistry every day.
- 2) Engage in the material and be an active learner. Take handwritten notes during class and honestly attempt in-class and out-of-class work.
- 3) Complete practice problems from handouts and D2L homework. I recommend working without your notes first to test your understanding.
- 4) Seek help from available resources. Reach out to me, your peer mentor, other chemistry students, peer tutoring, etc. You can attend my drop-in office hours or schedule an appointment.

### Chemistry Peer Learning Hours

Drop-in peer learning is available this semester. No appointments needed!

Tues	5:00 – 7:00 pm	Roddy 256
Wed	12:00 – 2:00 pm	<b>Caputo 211</b>
	5:00 – 7:00 pm	Roddy 256
Thurs	12:00 – 2:00 pm	Roddy 256
	5:00 – 7:00 pm	Roddy 256

### How will I be graded in this class?

Course Engagement	10%
Homework Assignments	20%
In-Class Activities	20%
Quizzes	10%
Transition Topic Events & Activities	20%
<u>Final Project</u>	<u>20%</u>
Total	100%

Final letter grades will be assigned on a standard plus/minus scale:

A: 90-100% (A: 93-100; A-: 90-93)

B: 80-90% (B+: 87-90; B: 83-87; B-: 80-83)

C: 70-80% (C+: 77-80; C: 73-77; C-: 70-73)

D: 60-70%

F: less than 60%

### Engagement, 10%

Engagement in a class is essential for success in college and for learning chemistry! You are expected to attend class, fully participate, and take responsibility for learning course material. Occasional reflection surveys will be assigned.

### Homework, 20%

There will be two types of homework assignments depending on the chemistry topics we are discussing:

- (1) Handouts/Learning activities. Some homework assignments will be handouts that you will be expected to complete and return to me hardcopy or submitted to D2L by the due date.

- (2) D2L Homework assignments. Some homework assignments will be assigned on D2L where you will have multiple opportunities to complete practice problems in order to gain mastery of material.

### **In-Class Activities, 20%**

During class we will have different individual and group activities depending on the topic(s) of the day. You are expected to participate and complete any class or lab activities assigned.

### **In-Class Quizzes, 10%**

We will have short, in-class quizzes throughout the semester. These will be an opportunity for you to demonstrate your individual understanding of chemistry topics and your ability to apply and analyze the material from the course.

### **Make-Up Quiz Policy**

If you know ahead of time that you will miss an quiz you must tell me as soon as possible. You will be expected to take the quiz before the scheduled period unless illness or a family emergency causes a late make-up to be necessary. The make-up will not necessarily be the same as the quiz administered to the rest of the class. Missing a quiz without prior permission will result in a score of zero and cannot be made up. The lowest quiz score of the semester will be dropped.

### **Learning Accommodations**

Any student who meets the eligibility requirements to receive academic accommodations through learning services should speak with the Office of Learning Services in Lyle Hall as early in the semester as possible. For more information: <http://www.millersville.edu/learningservices>.

### **Transition Topic Events and Activities, 20%**

Your completion of transition topic activities and participation in transition topic events this semester is required! In addition to completing the activities and attending events, you will be reflecting on the experience with reflection prompts and/or surveys. Please note: you will be asked to attend sessions that meet outside of our standard course meeting time. If you have any concerns about the timing of any of these activities, please let me know as soon as possible. Details for assignments will be posted on D2L and discussed in class.

#### **Required Assignments(s):**

- Goal Setting and Planning Assignments
- Study Skills Assignments and Metacognitive Reflection
- Other(s) as described on D2L

#### **Required events/activities:**

- Starfish Overview and “Raise Your Hand” Assignment      Asynchronous
- Success Coaching To-Do’s for Success      Asynchronous
- Career Center Competencies      Asynchronous
- McNairy Library Activity      Asynchronous
- Financial Literacy Activity      Info coming soon
- Campus Safety Strategies and Title IX      Info coming soon
- Diversity and Inclusive Excellence      Info coming soon
- Attend and participate in at least **one** wellness tabling event

- Attend and participate in at least **one** academic success tabling event
- Attend at least **two** seminars related to your interests, your major or your intended career. These may be hosted by your department, your college, or by professional societies in your field. These may be in-person or virtual seminars.

**Optional events/activities (to earn additional 'late tokens'):**

- Additional wellness or academic success tabling events
- Additional seminars about relevant topics. These could be related to your major, intended career path or focus on study skills, wellness, or campus life.
- Career Center FOCUS2 module (asynchronous)
- FYEX Peer Educator Presentations
- Green Dot Training (bystander intervention strategy)
- Other events or activities that align with transition course goals that are posted on D2L. Please let me know if there are any others you feel could be beneficial that we can add to this list.

**Final Project, 20%**

Throughout the course, we will learn about the chemical properties of dyes and pigments as well as different conditions that can affect color and molecular structure. Your final project will be an investigation of the stability of different dyes/pigments exposed to an environmental condition. Through scaffolded assignments, you will select a pigment or dye from those available and investigate the history and cultural importance of the color and/or pigment. You will choose a material and environmental condition, develop a hypothesis, and predict the outcome of your experiment. After completing the experiment, you will prepare a result summary to share with the class in a gallery-style presentation and reflection. This will be held during the final exam period **Thursday, Dec 12<sup>th</sup> from 8-10 am**. More details will be provided in class and on D2L.

**Course Policies:**

Class Attendance and Participation

You are expected to attend all classes and complete all assignments. Please contact me if you are unable to attend a class session.

Computer Resources

You will be expected to use **D2L** and set up alerts for any announcements posted to the D2L site. This provides mechanisms for contact, distribution of information and data, submission of written work, completion of peer reviews, etc. You are expected to **check your email** regularly. You are also responsible for all course information sent to your campus email address.

Submitting Late Work

As your instructor, I have designed this course to help you learn chemistry and to learn information that will help you throughout your time at Millersville. All of the course components and assignments are included because I truly believe they will help you meet learning objectives. Because of this, I encourage you to submit work even if it is late as there is a learning benefit to completing all assignments. However, it is important that you progress steadily through the material and do your best to complete work by the deadlines. Work submitted after a deadline is subject to a late penalty of 10% per day. Each student will start the semester with two (2) late tokens that can be used as needed (because life happens!). There are

opportunities to earn additional late tokens throughout the semester by attending other transition topic events, completing other transition assignments, and/or engaging in additional reflection.

### Diversity and Inclusion Policy

This course is a judgement free and inclusive learning environment. Our class includes students from a wide variety of social identities and life circumstances. Everyone will treat one another with respect and consideration at all times or be asked to leave the classroom.

As your instructor I will:

- Learn and correctly pronounce everyone's names.
- Use correct pronouns for those who wish to indicate this to me/the class
- Work to accommodate/prevent English language related challenges

If you tell me that you are having trouble I will not judge you or think less of you. You do not owe me an explanation of your health (physical or mental) or the health of your loved ones; but you are welcome to tell me and I will listen. If I can not help you, I will find someone who can. If you need help or more information, please ask and I will work with you.

### Land Acknowledgement

We would like to recognize the Native peoples of the lower Susquehanna River basin, those known and those unknown to us, who have stewarded the land, upon which Millersville University sits, for thousands of years. We acknowledge that the land on which we gather, study, and work is the ancestral land of the Conestogas, Susquehannocks, Shawnee, and others. One group, the Shenks Ferry people, had a village adjacent to the campus. We pay our respects to the traditional occupants and caretakers of this land.

### Academic Honesty

Students are expected to abide by the policy outlined by Millersville University shown below. During any group class or laboratory work students will collaborate on collecting, interpreting, reporting data and information. Students are expected to contribute equally to collaborative work. Fabrication of data or plagiarism in preparing assignments, reports, or projects will not be tolerated in this course. Anyone caught cheating in these ways will be assigned a score of zero on the work.

Your instructor knows how to use Google, Chegg, and other study sites. Please do not post questions from in-class assessments on sites such as Chegg. It is also against our academic honesty policy to use AI technology (such as ChatGPT) for any assessments. All answers submitted should be in your own words (even when assessments are open-resource

According to Millersville University's Academic Honesty Policy: *"Students of the University are expected to be honest and forthright in their academic endeavors."* If you break the academic honesty policy, there are severe penalties. A failing grade will be assigned and you may be prosecuted by an Academic Review board. Actions that violate the Academic Honesty Policy are:

1. Plagiarism: inclusion of someone else's words, ideas, or data as one's own work.
2. Fabrication: falsification of research or other findings.
3. Cheating: the act or attempted act of deception by which an individual tries to misrepresent that the individual has mastered subject matter in an academic project or the attempt to gain an advantage by the use of illegal or illegitimate means. Submitting in-class participation cards for another student is considered cheating.

4. Academic Misconduct: violation of University policies by tampering with grades or participating in the distribution of any part of a test before its administration.

For more information: <https://www.millersville.edu/policies/pdf/faculty/faculty-policy-academic-dishonesty-and-plagiarism.pdf>

### Official Attendance Policy

1. Students are expected to attend all classes. It is the student's responsibility to complete all course requirements even if a class is missed. If a student misses class for an officially excused reason, then the student is entitled to make up the missed work but only at the convenience of the faculty member. Responsibility for materials presented in, assignments made for, and tests/quizzes given in regularly scheduled classes lies solely with the student.
2. The Millersville University policy states that faculty will excuse absence for the following reasons:
  - a. personal illness
  - b. death or critical illness in the family
  - c. participation in a university-sponsored activity
  - d. jury duty
  - e. military duties
  - f. religious holidays
3. Faculty judge the validity of student absences from class within the University's approved guidelines and may require documentation for excuse absences. Faculty will evaluate any reason, other than those listed above, for a student missing class and determine whether the absence is justified. In these circumstances, a student may make up missed work at the discretion of the instructor.
4. In the case of foreseeable absences, students are encouraged to notify the faculty member in advance. A student who will miss class due to participation in an official University activity must notify the instructor well in advance of the activity to assure that the absence is excused.
5. For more information: [http://www.millersville.edu/registrar/faculty/attendance\\_policy.php](http://www.millersville.edu/registrar/faculty/attendance_policy.php)

### Title IX Statement

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, Title IX requires University faculty members to report incidents of sexual discrimination, including sexual violence, shared by students to the University's Title IX Coordinator. Accordingly, if a student shares information about any incidents of sexual discrimination or sexual violence during a classroom discussion, in a writing assignment for a class, or in other contexts, faculty must report that information to the Title IX Coordinator. This information will only be shared with the Title IX Coordinator, who is the individual on campus designated to respond to reports of discrimination or sexual violence. While the Title IX Coordinator is not a confidential source of support, they will address matters reported to them with sensitivity and will keep your information as private as possible. Additionally, faculty members are obligated to report sexual violence or any other abuse of a student who was, or is a child (a person under 18 years of age) when the abuse allegedly occurred, to the person designated in the University's Protection of Minors policy.

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: [www.millersville.edu/titleix](http://www.millersville.edu/titleix)

### Counseling Reminder

Students sometimes face mental health or drug/alcohol challenges in their academic careers that interfere with their academic performance and goals. Millersville University is a caring community and resources are available to assist students who are dealing with problems. The Counseling Center (717-871-7821) is an important resource for both mental health and substance abuse issues. Additional resources include: Health Services (717-871-5250), Center for Health Education and Promotion (717-871-4141), Campus Ministries, and Learning Services (717-871-5554).

### Americans with Disabilities Act

Millersville University is committed to equality of opportunity and freedom from discrimination for all students, employees, applicants for admission or employment, and all participants in public University-sponsored activities. In keeping with this commitment, and in accordance with the Americans with Disabilities Act (ADA) the University will make every effort to provide equality of opportunity and freedom from discrimination for all members of the University community and visitors to the University, regardless of any disability an individual may have. Accordingly, the University has taken positive steps to make University facilities accessible to individuals with disabilities and has established procedures to provide reasonable accommodations to allow individuals with disabilities to participate in University programs. The University administration and management are obligated to report any allegation of discrimination to the appropriate office as defined in this policy.

**Please let me know how I may make accommodations in the classroom setting that will enhance and support your learning.**