



Education Department
ED356.M1 TEACHING SCIENCE IN
MIDDLE CHILDHOOD & ADOLESCENCE

4 Semester Hours

Fall 2025

Main Campus

Mondays 6:00-9:00pm, College Hall 109

Jason Moore

Cell: 937-570-2011 - Please no texts or calls after 10:00pm or before 7:00am

Email: jason.moore@wilmington.edu- Please allow up to 24 hours for a response.

Office Hours: I will be available before or after class or by appointment providing you email me 24 hours in advance to ensure that I will be there to meet you. A virtual conference can also be scheduled with a 24 hour notice.

Required Text

Lemov, D. (2021). *Teach like a champion 3.0: 63 techniques that put students on the path to college*. John Wiley & Sons.

Optional:

Wong, H.K. and Wong, R.T. (1998) *The First Day of School*. Harry K. Wong Publications, Inc., California.

Keeley, Page. (2008). *Science formative assessment: 75 practical strategies for linking assessment, instruction, and learning*. Thousand Oaks, CA: Corwin Press, 2008.

Recommended Resources

[Ohio Science Learning Standards and Model Curriculum](#)

[Next Generation Science Standards - All Topics](#)

Course Format

In Person

Course Description

This course equips prospective science teacher candidates with the skills, strategies and techniques that allow students to develop their interest and enthusiasm for science, problem solving and science literacy. Teacher candidates will participate in and lead hands-on, inquiry-based activities. Teacher candidates also use technology to enhance their own background knowledge and are provided with a conceptual framework that embraces the idea that science classrooms provide for individual differences such as gender, ethnicity, culture and socioeconomic background. A summative final assignment is to create a detailed plan for a science unit on a subject from the Ohio Model Curriculum and to implement it in the field, complete with identified objectives, materials, lessons, teaching strategies, accommodations, assessments and future planning.

This course should be taken with a field practicum.

Skill: I

Prerequisite: Admission to the Teacher Education Program.

Course Goals

During this course preservice science teachers (grades 4-9 and 7-12) will engage with the 2020 NSTA Preservice Science Standards:

- Standard 1: Content Knowledge - Effective teachers of science understand and articulate the knowledge and practices of contemporary science and engineering. They connect important disciplinary core ideas, crosscutting concepts, and science and engineering practices for their fields of licensure.
- Standard 2: Content Pedagogy - Effective teachers of science plan learning units of study and equitable, culturally-responsive opportunities for all students based upon their understandings of how students learn and develop science knowledge, skills, and habits of mind. Effective teachers also include appropriate connections to science and engineering practices and crosscutting concepts in their instructional planning.
- Standard 3: Learning Environments - Effective teachers of science are able to plan for engaging all students in science learning by identifying appropriate learning goals that are consistent with knowledge of how students learn science and are aligned with standards. Plans reflect the selection of phenomena appropriate to the social context of the classroom and community, and safety considerations, to engage students in the nature of science and science and engineering practices. Effective teachers create an anti-bias, multicultural, and social justice learning environment to achieve these goals.
 - Standard 4: Safety - Effective teachers of science demonstrate biological, chemical, and physical safety protocols in their classrooms and workspace. They also implement ethical treatment of living organisms and maintain equipment and chemicals as relevant to their fields of licensure.
- Standard 5: Impact on Student Learning - Effective teachers of science provide evidence that students have learned and can apply disciplinary core ideas, crosscutting concepts, and science and engineering practices as a result of instruction. Effective teachers analyze learning gains for individual students, the class as a whole, and subgroups of students disaggregated by demographic categories, and use these to inform planning and teaching.
- Standard 6: Professional Knowledge and Skills - Effective teachers of science strive to continuously improve their knowledge of both science content and pedagogy, including approaches for addressing inequities and inclusion for all students in science. They identify with and conduct themselves as part of the science education community.

Course Topics

- Ohio's Learning Standards: Science ▪ Next Generation Science Standards ▪ Yearly/Unit/Lesson Planning and Mapping ▪ Understanding by Design
- Universal Design for Learning
- Assessment Methods
- Instructional Strategies
- Active Learning Strategies
- Inquiry Science
- Classroom Demonstrations
- Differentiating Instruction

- Classroom Equipment and Technology ▪ PBIS, Classroom Management, and Restorative Practices
- Lab Safety and Management
- Relationships/Communication
- Scientific Literacy
- Ohio Teacher Evaluation System (OTES 2.0) 2

Course Calendar

The course calendar is subject to change. Please consult classroom notes, instructor emails, and Blackboard communications throughout the course.

Week	Date	Topics	Assignments & Assessments	Class Format
1	8/24	Introduction to the Course Science Education & Standards Beginning of the Year	Discussion Post	In-Person
2	8/31	Building Relationships and Communication	Discussion Post	In-Person
3	9/7	No In Person Class (Labor Day)	Discussion Post	Online
4	9/14	Curriculum Planning - Year and Unit	Introduce Unit Plan	In-Person
5	9/21	Planning - Week, Day, Sub, Emergency	Planning Activity	In-Person
6	9/28	Assessment / Grading	Formative and Summative Assessment Techniques	In-Person
7	10/5	Classroom Management	Behavior Plan Project	In-Person
8	10/12	Classroom Management	Classroom Management Plan	In-Person
	10/19	Fall Break No Class		
9	10/26	Classroom and Lab Set Up - Equipment Usage	Technology Research	In-Person
10	11/2	Instructional Strategies	Discussion Post	In-Person
11	11/9	Science Engineering, Society, and PBL	Small Group Instruction Project Discussion Post	In-Person

12	11/16	Labs & Safety	Coffee Lab Discussion Post	In-Person
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13	11/23	End of the Year - What to Expect	Unit Plan Rough Draft	In-Person
14	11/30	Getting a Job	Resume	Online
15	12/7	Review Unit Plan Constructive Feedback	Course Reflection Final Exam and Project	TBD
16	12/14	Final Exam	Online Submission	In Person

All policies default to Wilmington College guidance and the Student Handbook

Grading Scale

EDUCATION MAJORS MUST PASS THIS CLASS WITH A C OR BETTER FOR THIS CLASS TO COUNT FOR GRADUATION. Points are earned in various ways during the course and a percentage of the total points will determine the final course grade.

Grade	Percent of Total Points Possible
A	100-95
A-	90-94
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
F	Below 62

Assignments

Discussion Boards

- Students are expected to actively participate in the discussion board each week. Students are required to **post an initial response to the discussion board prompt(s) no later than Sunday at 11:55PM** of the current week's discussion board. Then each student must respond to the initial postings of **at least one classmates by Tuesday of that following week by 11:55pm**. Discussions not completed on time will result in a 10% deduction to the earned grade.

Graded Assignments

- Each week students are expected to complete all graded assignments listed for the week. Graded assignments can range in terms of scope and design. All graded assignments, however, include clear instructions on how students shall complete the work.

Course Assessments

- There will be a midterm consisting of 100 points for this course.. There will also be a final exam consisting of 200 points for this course. The final exam will also consist of creating a detailed science unit.

GENERAL INFORMATION

Online Course Policies Effective Fall 2020

Course Week Definition

Wilmington College defines an online course week as one which commences at 6:00 A.M. each Monday and ends at 10:00 P.M. the following Sunday. Participation in the scheduled live synchronous sessions and all weekly course requirements must be completed and submitted electronically in the prescribed manner to the course instructor within the instructor's assigned deadlines for assignments and participation that week.

Academic Misconduct

Students with academic integrity violations may not be eligible for academic awards and honors (i.e., Academic Honors, Dean's List/Merit List, Green Key Honor Society, Quaker Impact Award, and other Honorary Societies). See the current Student Handbook for the college's Academic Integrity policies as they pertain to examinations, classroom behavior, and the process for handling academic misconduct charges. See the separate policy dealing with plagiarism below.

Americans with Disabilities Act

In accordance with ADA, Wilmington College provides reasonable accommodation to students with physical and mental disabilities. If you have a documented disability that requires accommodation, please notify the Disability Services Director at (937) 481 – 2444, Robinson Communication Center during business hours and the instructor by the end of the first class.

Attendance

All students enrolled in hybrid traditional courses must participate in scheduled physical classroom and corresponding live online synchronous sessions as well as log in to the course(s) on Blackboard and complete any assignment(s) or other activities, to be determined by the instructor.

Attendance is required for all class weeks. In the case of hybrid traditional courses, “absences” shall be defined as “non-participation.” Non-participation shall be defined as but is not limited to 1.) Not attending all scheduled physical class sessions and live online synchronous sessions at the regularly scheduled meeting time. 2.) Not following the instructor’s participation guidelines as stated in the syllabus; 3.) Not submitting required assignments; 3.) Not contributing meaningful discussion in required chat rooms, discussion boards, or other online forums; 4.) Not participating in scheduled activities; and 5.) Failure to communicate with the instructor as required. Failure to attend as defined above constitutes an absence.

It should be noted that simply logging into the course does not constitute participation. Students must demonstrate that they are actively participating in the course by submitting required assignments, attending scheduled physical classroom and corresponding synchronous sessions, contributing to discussion forums, etc. as outlined above.

Copyright Policy

This course may contain copyright protected materials such as audio or video clips, images, text materials, etc. These items are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

Workload (Hybrid Traditional Courses)

A minimum of two hours of student work per week is expected for each credit hour awarded for the class. This means that students enrolled in an online 4 credit hour course over a full semester should anticipate spending at least 8 hours of work each week to complete the requirements of the course.

Plagiarism Policy

Plagiarism is defined as the representation of another’s words, ideas, concepts, research or creative production without proper attribution whether intentional or unintentional. It is the student’s responsibility to be informed about what constitutes plagiarism. Plagiarism can occur in the submission of one’s own work or in work submitted by a group.

Examples of plagiarism include the following:

- The submission of a paper not one’s own, including turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- Copying word for word information without quotation marks
- Paraphrasing information (that is, the use of one’s own words with only minor changes to the original)
- Use of information not considered general knowledge without proper citation
- Listing of misleading or false sources on a reference page
- The use of a paper or project for one course that was previously submitted for another course, either at Wilmington or at any other institution

Plagiarism is a serious academic offense and carries serious academic consequences. Violations will be recorded by the Associate Vice President of Academic Affairs at the Main Campus and Vice President of External Programs at the Cincinnati Branch Campus.

When an instructor discovers plagiarism, the instructor will first consult with the Associate Vice President of Academic Affairs if a main campus student, or the Vice President for External Programs if a branch campus student, in order to determine if the student is a first-time offender. For first offenses, the instructor has the ability to determine the penalty for the offense. Students with academic integrity violations may not be eligible for academic awards and honors (i.e., Academic Honors, Dean's List/Merit List, Green Key Honor Society, Quaker Impact Award, and other Honorary Societies). For a second offense or more, the Associate Vice President of Academic Affairs at the Main Campus or the Vice President for External Programs for students at the branch campus, will report the offense to the academic standards and appeal committee and gather evidence for a hearing with the student. It is possible that the student will receive a substantial reduction in grade for the course or will fail the course. Multiple instances could even lead to suspension or expulsion from Wilmington College.

There are many university, college and private websites students may consult about how to avoid plagiarism. Sites with particularly helpful suggestions can be found at:

- <http://owl.english.purdue.edu/owl/resource/589/01/>
- <http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>
- <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize> •
- <http://www.princeton.edu/pr/pub/integrity/08/intro/index.htm>
- http://www.plagiarism.org/plag_article_preventing_plagiarism_when_writing.html •
- <http://citationmachine.net/index2.php>

Third-Party Software and FERPA Policy

During this course you might have the opportunity to use public online services and/or software applications sometimes called third-party software such as a blog or wiki. While some of these could be required assignments, you need not make any personally identifying information on a public site. Do not post or provide any private information about yourself or your classmates. Where appropriate you may use a pseudonym or nickname. Some written assignments posted publicly may require personal reflection/comments, but the assignments will not require you to disclose any personally identity-sensitive information. If you have any concerns about this, please contact your instructor.

Weather Policy

Class is cancelled if Wilmington College is closed. Ohio State Highway Patrol and surrounding county information will also be considered. Students will be notified via email and/or Blackboard at least two hours prior to class if it is cancelled. Coursework and assignment information will be included as well.

Use of Electronic Devices

Use of WC Blackboard (Ultra) and WC Email are required. Watson Library, Pyle Center, and WC Computer Lab computers are available for use. Smart phones, tablets, and laptops with WC Student or other wireless connection to the Internet is highly encouraged. Use of electronic devices must be used to make relevant contributions to the class. Use of devices to DISENGAGE from class is unacceptable and the instructor may require the suspension of device usage at any time.

Title IX Statement of Policy.

Consistent with Wilmington College's testimony, "I will respect the dignity of all persons," Wilmington College (or the "College") is committed to providing a learning, working, and living environment free of discrimination, including discrimination on the basis of sex and gender by employees, students, and third parties. Pursuant to Title IX of the Education Amendments of 1972 (Title IX), Wilmington College prohibits discrimination based on sex (including gender identity, gender expression, and sexual orientation) in its educational, extracurricular, athletic, or other programs or activities that it operates, or in the context of admissions or employment. Specifically, Title IX provides, "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." Wilmington College considers sex and gender discrimination in all its forms, including sexual harassment, to be a serious offense. Consistent with Wilmington College's commitment to compliance with Title IX, the College will promptly and equitably respond to all reports and formal complaints under this Sex Discrimination & Sexual Harassment Policy (the "Policy") in order to end the conduct, prevent its recurrence, and address its effects on individuals and the community. Inquiries regarding the application of this Policy may be directed to the Title IX Coordinator, the Assistant Secretary of the Office for Civil Rights of the Department of Education, or both.

Religious Accommodations

Wilmington College strives for an inclusive climate and welcomes students from all backgrounds, faiths, and experiences. If religious observance impedes your ability to participate fully in classroom activities or a principal holiday from your religious tradition occurs during the semester and conflicts with class meetings or activities, please make the professor aware of this immediately to determine if a reasonable accommodation is possible.

ADA and Students with Disabilities [Main Campus and Online courses]. Wilmington College and the Office of Compliance and Integrity are committed to ensuring equal access to students with disabilities, including physical, medical, and psychiatric disabilities. If you are a student with a disability and feel you may need a reasonable accommodation to fulfill the essential functions of this course, you are encouraged to connect with Nathan Flack, Academic Resource Center Manager/ADA Coordinator by visiting the Academic Resource Center located in Robinson Communication Center, Room 103 or connecting via email/phone at nathan.flack@wilmington.edu or 937-481-2208 (TTY: Ohio Relay 711 for deaf/hard of hearing). Please understand that formal eligibility communication from the Office of Compliance and Integrity must be presented prior to the coordination of accommodations for this course.

WC Mission Statement

- The purpose of Wilmington College is to educate, inspire, and prepare each student for a life of success and services.
- To fulfill that purpose, Wilmington College provides a high quality undergraduate and graduate education shaped by the traditions of the liberal arts, career preparation, and the distinctive values of the Religious Society of Friends (Quakers). By offering academic programs, practical experience, and co-curricular activities in a variety of settings to students from diverse backgrounds, the College leads students to gain an awareness of the world, to acquire knowledge of career and vocation, and to seek truth and social justice.
- In keeping with the rich heritage of the liberal arts, the College seeks to educate the whole person-intellectual, emotional, physical, and spiritual-in ways that foster critical thinking, reflection, the free exchange of ideas, open inquiry, tolerance, and a desire for lifelong learning.

The liberal arts are integrated with career preparation to help students develop the knowledge and skills to succeed in a career or further education.

- As an academic community, Wilmington College is rooted in historic Quaker values that include integrity, service, simplicity, equality, peace and social justice, and respect for all persons. These values motivate those who learn and work at Wilmington College to make positive contributions to their professions and their communities.

Education Department Mission

The Education Department Mission is to prepare educators in the liberal arts tradition. Faculty members collaborate to develop professional educators who demonstrate a thorough knowledge of the subjects they will teach and of the teaching and learning process. Teacher education candidates in particular will gain the ability to teach diverse student populations and develop an understanding of the cultures and communities in which they practice. As educators they will be equipped to create positive learning environments that encourage active student engagement and self-motivation. Education Area graduates will become reflective practitioners who are able to collaborate with a variety of stakeholders in establishing learning communities.

References

National Science Teachers Association. (2020). *NSTA preservice science standards*. Arlington, VA. 9