



SCE 4320
Teaching Methods in Middle Grade Science I
83721 001
Fall 2026

Instructor Name

Rachel Wagner

University Course Description

The purpose of this course for education majors is to develop pedagogical content knowledge as it pertains to the teaching and learning of science, concentrating on skills and strategies necessary to teach science at the middle school level.

Course Requisites

Prerequisite(s):

Corequisite(s):

SCE 3941

SCE 3942

EDM3403

Course Format

This course will be held in-person at the scheduled time however some weeks may be held virtually asynchronously. Refer to the course schedule below and Canvas for class location.

Student Learning Outcomes

- Develop an understanding regarding of 21st century skills in science education.
- Develop an understanding and methodology of teaching those scientific skills
- Develop curriculum and ways to integrate into current district curriculum methods of teaching those scientific skills
- Design and facilitate inquiry-driven investigations that require middle school students to ask questions, plan procedures, and draw evidence-based conclusions
- Create integrated, student-centered lesson plans utilizing the 5E (Engage, Explore, Explain, Elaborate, Evaluate) or some other inquiry based instructional model.
- Select and effectively use digital tools, simulations, and data-collection software to enhance scientific modeling and data analysis.
- Examine the relationship between science, technology, and society, empowering students to apply scientific reasoning to real-world, local, and global issues.
- Align instructional units and learning targets with state science education standards.

Course Objectives

You will participate in several long and short-term inquiry-based science experiences. These, along with readings and other assignments, will provide the base for our discussions of ways to teach science with middle school students. Through these experiences, you will construct your own approaches for teaching children science and develop plans for doing so. In the spirit of inquiry-based science education, multiple methods will be included throughout the course. These will include, but not be limited to: direct instruction, guided discovery, inquiry-based projects, group discussions, and small-group activities. The specific goals for the semester are that students will be able to:

- Demonstrate understanding of the central concepts (content), tools of inquiry (process skills), and structure of science (the nature of science) appropriate to teaching at the middle level
- Demonstrate understanding of the social, intellectual, and personal development of students and recognize the diverse needs, interests, and abilities of students in regard to science at the middle level
- Demonstrate knowledge of and ability to critically evaluate and utilize contemporary science standards and curriculum materials for science education
- Demonstrate knowledge of and ability to plan and implement a variety of instructional strategies and assessment techniques for teaching science inquiry through hands-on, minds-on activities that foster scientific “habits of mind” and promote scientific literacy
- Demonstrate the capacity to create a positive environment that encourages

science learning by modeling the attitudes and dispositions of scientific inquiry

- Demonstrate the capacity for collegiality, reflective practice, and professional growth in regard to science teaching

* Florida Educator Accomplished Practices (FEAPs) (2010)

** Florida Learning Competencies: Middle Education (2014)

*** Association for Childhood Education International Middle Education Standards (2007)

**** USF College of Education Conceptual Framework

Required Texts and/or Readings and Course Materials

You will need a working laptop to access various educational platforms and Canvas. Please bring your laptop to each class. You will also need to be able to download free educational apps to your smartphone or mobile device. Information will be provided during the course.

How to Succeed in this Course

Success in this course requires a commitment to growth, professionalism, and active learning. Approach challenges with a growth mindset, recognizing that effective science teaching develops through practice, reflection, and feedback. Attend class regularly and arrive on time, as many learning experiences cannot be replicated outside of class. Complete assignments by their deadlines, actively participate in discussions and activities, and communicate with the instructor promptly if questions or concerns arise. Students who engage fully, seek support when needed, and consistently put forth their best effort are most likely to succeed in this course and in their future teaching careers.

Grading Scale

Plus, minus, or none	A	B	C	D	F
+	98-100	88-89.99	78-79.99	68-69.99	0-59.99
	94-97.99	84-87.99	74-77.99	64-67.99	
-	90-93.99	80-83.99	70-73.99	60-63.99	

You can find your grades for this course in Canvas. If you have any questions or concerns about your grade on an assignment, please send a Canvas message to the instructor.

Grade Categories and Weights

Assignment/Assignment Category	Weight
Scientist autobiography	10%
Resource assignment	10%
Inquiry mini lesson planning	10%
Inquiry mini lesson delivery and reflection	15%
Subject area exam/lesson plan evaluations	10%
In-class assignments	10%
One pager	10%
Attendance	10%
Final paper	15%

Instructor Feedback Policy & Grade Dissemination

To provide thoughtful, meaningful, and individualized feedback, assignments will typically be graded within two weeks of the submission deadline. While every effort will be made to return assignments sooner, grading timelines may vary during periods of high submission volume or university holidays. If grading is delayed beyond two weeks, students will be notified through the course announcements on Canvas.

Note: The two-week grading timeline applies to assignments submitted on time. Late submissions may require additional processing time and may be graded after all on-time submissions have been evaluated.

Students are responsible for regularly reviewing their grades and feedback and should verify that the score received on an assignment matches the score recorded in the course gradebook on Canvas. Although every effort is made to ensure accuracy in grade recording, errors can occasionally occur. If you believe a discrepancy exists, please notify the professor as soon as possible so it can be reviewed and corrected if necessary.

Major Topics and Course Schedule

August 25 - Introductions and lab safety

September 1 - Ed tech tools and cooperative learning strategies, Nature of Science

September 8 - Inquiry

September 15 - SSI

September 22 - Generative AI

September 29 - Simulations
October 6 - Asynchronous class on Canvas - Resource assignment
October 13 - Physical science
October 20 - Mini-lessons workshop
October 27 - Earth/space science
November 3 - Life science
November 10 - Inquiry mini lessons
November 17 - Inquiry mini lessons
Week of November 24 - No class - Thanksgiving holiday - One pager
December 1 - Last class - Mixed topics
Week of December 8 - No class - Final reflection paper

**Please note the schedule is subject to change. Be sure to check Canvas and listen to in class announcements for changes.*

USF Core Syllabus Policies

USF has a set of central policies related to student recording class sessions, academic integrity and grievances, student accessibility services, academic disruption, religious observances, academic continuity, food insecurity, pregnancy and related conditions, and sexual harassment that **apply to all courses at USF**. Be sure to review these online:

<https://www.usf.edu/provost/faculty-success/resources-policies-forms/core-syllabus-policy-statements.aspx>

Student Recordings

Florida Statute 1004.097 Free Expression on Campus

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal, educational use (USF Policy 10-048). A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach enrolled students about a particular subject. Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion, clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, private

conversations between students in the class or between a student and the faculty member is prohibited. Recordings may not be used as a substitute for class participation and class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the USF Student Conduct Code.

Course Policies: Grades

Group Work Policy

All members of a group will receive the same score. Once formed, groups cannot be altered or switched, unless approved by the professor.

First Day Attendance

Students must attend the first class to confirm their presence in the course, which will count as first day attendance. Students who don't complete the first day activity run the risk of being dropped from the course.

Attendance Policy

Regular attendance, punctuality, and active engagement are essential professional responsibilities of educators. Because this course is designed to prepare future teachers for the expectations of the profession, these behaviors are reflected in the attendance and participation grade.

Each class session is worth 10 attendance points. Students who are absent will receive 0/10 points for that class session. Attendance points are earned as follows:

Punctuality (5 points): Students who arrive on time and remain for the entire class session will earn the full 5 points. Students who arrive more than 5 minutes late or leave more than 10 minutes before the end of class will receive 0/5 punctuality points for that day.

Active Engagement (5 points): Active engagement includes participating in discussions and activities, collaborating with peers, and remaining attentive during class. Points may be reduced for behaviors that interfere with engagement, including excessive phone use, non-course-related computer use, or other distractions that limit participation in class learning experiences.

There are no make-ups for in-class assignments. Students without approval from the professor for an absence will receive a 0% for any assignments missed during the absence.

Note: Because unforeseen circumstances occasionally occur, students are permitted one unexcused absence and one punctuality infraction without penalty. After these allowances have been exhausted, attendance points will be

deducted according to the course policy. The attendance applies except in the event of extenuating circumstances approved by the professor or if the student provides appropriate documentation (see "Medical Excuses" below).

Late Work

When pre-service teachers turn in assignments punctually, they are not just completing a course requirement; they are actively preparing for the professional responsibilities of teaching. In a classroom, teachers are held accountable for lesson plans, grading deadlines, reporting student progress, and meeting school-wide obligations. Submitting assignments on time in college mirrors these expectations and develops the discipline needed for success in the teaching profession.

Assignments turned in late will be assessed a penalty: 20% off if submitted one (1) day late and 40% if submitted two (2) days late. Assignments submitted three (3) days or more after the deadline will receive a score of 0%. The late work policy applies except in the event of extenuating circumstances approved by the professor or if the student provides appropriate documentation (see "Medical Excuses" below). Assignments that are not submitted will receive a score of 0%.

For example, if the assignment is due Wednesday at 11:59 PM, the late penalty is as follows:

Submitted	Penalty	Maximum possible score
Thursday 12:00 AM-11:59 PM	20%	80%
Friday 12:00 AM-11:59 PM	40%	60%
Saturday 12:00 AM-beyond	100%	0%

Please be aware that discussion board assignments (e.g., Lesson plan evaluations) will close at the deadline indicated in Canvas to ensure time for peer review and feedback. Late submissions for the initial posts will not be accepted.

Grades of "Incomplete"

The current university policy concerning incomplete grades will be followed in this course. For undergraduate courses: An "I" grade may be awarded to a student only when a small portion of the student's work is incomplete and only when the student is otherwise earning a passing grade. The time limit for removing the "I" is to be set by the instructor of the course. For undergraduate students, this time limit may not exceed two academic semesters, whether or not the student is in residence, and/or graduation, whichever comes first. For graduate students, this time limit may not exceed one academic semester. "I" grades not removed by the end of the time limit will be changed to "IF" or "IU," whichever is appropriate.

Campus Free Expression

It is fundamental to the University of South Florida's mission to support an environment where divergent ideas, theories, and philosophies can be openly exchanged and critically evaluated. Consistent with these principles, this course may involve discussion of ideas that you find uncomfortable, disagreeable, or even offensive.

In the instructional setting, ideas are intended to be presented in an objective manner and not as an endorsement of what you should personally believe. "Objective" means that the idea(s) presented can be tested by critical peer review and rigorous debate, and that the idea(s) is supported by credible research.

In this course you may be asked to engage with complex ideas and to demonstrate an understanding of the ideas. Understanding and engaging with an idea does not require you to believe it or to agree with it.

Course Policies: Technology and Media

Technology

You will need a working laptop to access various educational platforms and Canvas. Please bring your laptop to each class. You will also need to be able to download free educational apps to your smartphone or mobile device. Information will be provided during the course.

Use of technology during class should be on task with the instruction. Please refer to the attendance policy regarding "active engagement."

Course Policies: Student Expectations

Health and Wellness

Your health is a priority at the University of South Florida. We encourage members of our community to look out for each other and to reach out for help if someone is in need. If you or someone you know is in distress, please make a referral at www.usf.edu/sos so that the Student Outreach & Support can contact and provide helpful resources to the student in distress. A 24-hour licensed mental healthcare professional, offered through the counseling center, is available by phone at 813-974-2831, option 3. Please remember that asking for help is a sign of strength. In case of emergency, please dial 9-1-1.

Title IX Policy

USF is committed to fostering a safe and respectful learning environment, free from sex discrimination and sexual harassment, in accordance with Title IX and USF Policy 0-004. If a student shares an experience of sexual harassment, sexual assault, stalking, or relationship violence with a USF employee (including faculty), that employee will notify the Title IX Office. This allows the Title IX Office to send the student an email with information about support resources and options—if it is safe to do so. Students are not required to respond to this email. The Title IX Office is a private resource. Information is shared only on a need-to-know basis to provide students with support measures. To speak to a confidential resource, students may contact USF Center for Victim Advocacy at 813-974-5757. Confidential resources do not notify the Title IX Office unless the student requests it. For more information about Title IX, available resources, or to make a report, please visit www.usf.edu/title-ix.

Course Hero / Chegg Policy

The USF Policy on Academic Integrity specifies that students may not use websites that enable cheating, such as by uploading or downloading material for this purpose. This does apply specifically to Chegg.com and CourseHero.com – almost any use of these websites (including uploading proprietary materials) constitutes a violation of the academic integrity policy.

Professionalism Policy

Per university policy and classroom etiquette; mobile phones, iPods, etc. must be silenced during all classroom and lab lectures. Those not heeding this rule will be asked to leave the classroom/lab immediately so as to not disrupt the learning environment. Please arrive on time for all class meetings. Students who habitually disturb the class by talking, arriving late, etc., and have been warned may suffer a reduction in their final class grade.

Turnitin.com

In this course, turnitin.com may be utilized. Turnitin is an automated system which instructors may use to quickly and easily compare each student's

assignment with billions of web sites, as well as an enormous database of student papers that grows with each submission. Accordingly, you may be expected to submit all assignments in both hard copy and electronic format. After the assignment is processed, as instructor I receive a report from turnitin.com that states if and how another author's work was used in the assignment. For a more detailed look at this process visit <http://www.turnitin.com>.

Netiquette Guidelines

- Act professionally in the way you communicate. Treat your instructors and peers with respect, the same way you would do in a face-to-face environment. Respect other people's ideas and be constructive when explaining your views about points you may not agree with.
- Be sensitive. Be respectful and sensitive when sharing your ideas and opinions. There will be people in your class with different linguistic backgrounds, political and religious beliefs or other general differences.
- Proofread and check spelling. Doing this before sending an email or posting a thread on a discussion board will allow you to make sure your message is clear and thoughtful. Avoid the use of all capital letters, it can be perceived as if you are shouting, and it is more difficult to read.
- Keep your communications focused and stay on topic. Complete your ideas before changing the subject. By keeping the message on focus you allow the readers to easily get your idea or answers they are looking for.
- Be clear with your message. Avoid using humor or sarcasm. Since people can't see your expressions or hear your tone of voice, meaning can be misinterpreted.

Email and Discussion Board Guidelines

- Use the subject line effectively by using a meaningful line of what your email or discussion is about.
- Keep your emails and postings related to the course content. You should not post anything personal on a discussion board unless it is requested by the instructor.
- Any personal, course or confidential issues should be directly communicated to the instructor via email. The discussion boards are public spaces; therefore, any issues should not be posted there.

End of Semester Student Evaluations

All classes at USF make use of an online system for students to provide feedback to the University regarding the course. These surveys will be made

available at the end of the semester, and the University will notify you by email when the response window opens. Your participation is highly encouraged and valued.

Food and Drink Policy (for in-campus sessions only).

Please adhere to the firm policy of no beverages (other than bottled/capped water), food, tobacco products, or like items in the classroom. Your understanding of the necessity for this policy and cooperation will be greatly appreciated. This policy will be strictly enforced.

Learning Support and Campus Offices

Academic Accommodations

Students with disabilities are responsible for registering with Student Accessibility Services (SAS) in order to receive academic accommodations. For additional information about academic accommodations and resources, you can visit the SAS website.

[SAS website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[SAS website for the St. Pete campus.](#)

Academic Support Services

The USF Office of Student Success coordinates and promotes university-wide efforts to enhance undergraduate and graduate student success. For a comprehensive list of academic support services available to all USF students, please visit the [Office of Student Success website](#).

Canvas Technical Support

If you have technical difficulties in Canvas, you can find access to the Canvas guides and video resources in the “Canvas Help” page on the homepage of your Canvas course. You can also contact the help desk by calling 813-974-1222 in Tampa or emailing help@usf.edu.

[USF IT Services](#)

Center for Victim Advocacy

The [Center for Victim Advocacy](#) empowers survivors of crime, violence, or abuse by promoting the restoration of decision making, by advocating for their rights, and by offering support and resources. Contact information is available online.

Counseling Center

The Counseling Center promotes the wellbeing of the campus community by providing culturally sensitive counseling, consultation, prevention, and training that enhances student academic and personal success. Contact information is available online.

[Counseling Center website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[Counseling Center website for the St. Pete campus.](#)

Tutoring

The Tutoring Hub offers free tutoring in several subjects to USF undergraduates. Appointments are recommended, but not required. For more information, email asctampa@usf.edu.

[Tutoring website for the Tampa campus and Sarasota-Manatee Teachout site.](#)

[Tutoring website for the St. Pete campus.](#)

Writing Studio

The Writing Studio is a free resource for USF undergraduate and graduate students. At the Writing Studio, a trained writing consultant will work individually with you, at any point in the writing process from brainstorming to editing.

Appointments are recommended, but not required. For more information or to make an appointment, email: writingstudio@usf.edu.

[Writing studio website for the Tampa campus and Sarasota-Manatee Teachout Site.](#)

[Writing studio website for the St. Pete campus.](#)

Student Ombuds Office

Florida Statute 1006.51 and Florida Board of Governors Regulation 6.011 require that all public institutions provide ombuds services to students. The Student Ombuds Office at USF is a confidential, impartial, informal, and independent resource for students experiencing challenges related to the university. Ombuds can help students safely explore options, clarify processes, and consider next steps. [Learn more or make an appointment at usf.edu/student-ombuds.](https://usf.edu/student-ombuds)