

Interdisciplinary Team Science

ENR 5510

Autumn 2022

Course Information

- **Course times and location:** Tuesdays and Thursdays 12:45 – 2:05 PM
- **Credit hours:** 3
- **Mode of delivery:** In person
- **Communication:** Class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](#) to be sure you receive these messages.

Instructor

- **Name:** Risa R. Pesapane
- **Email:** pesapane.1@osu.edu
- **Office location:** A100K Sisson Hall
- **Office hours:** Tuesdays from 1 – 3 PM
- **Preferred means of communication:** email

Course Description

The goal of this course is to teach students the skills to effectively collaborate in interdisciplinary teams. Funding agencies worldwide, including the NSF, are placing greater emphasis on interdisciplinary research. For example, the NSF has identified “Growing Convergence Research” as one of its 10 Big Ideas. True convergence research requires the development of interdisciplinary scientific teams (groups of two or more working collaboratively to solve a problem). However, graduate students are often siloed within programs, and not necessarily trained to engage with others outside their field. This course aims to teach students the necessary skills to lead and participate in scientific or interdisciplinary teams.



Course Goal and Learning Outcomes

The goal of this course is **to train graduate students the skills to effectively collaborate in interdisciplinary teams**. This entails that students will be able to meet the following learning outcomes.

- 1. Be familiar with the science of team science.**
 - Explain the main objectives and concepts of team science
 - Describe the history of team science and the science of team science
 - Explain the challenges and opportunities of team science
 - Appreciate how a team science approach can improve interdisciplinary teams.
- 2. Know the best practices for building and leading interdisciplinary teams.**
 - Locate resources for best practices in team science
 - Articulate the traits of successful interdisciplinary teams
 - Describe the stages of team formation and steps in building successful teams
 - Describe the key leadership skills useful in interdisciplinary teams
- 3. Communicate effectively within interdisciplinary teams.**
 - Recognize how disciplinary and personal backgrounds shape how team members approach the team project.
 - Reflect on how one's own disciplinary and personal background shapes one's own approach to the team project.
 - Explain clearly key concepts and methods from one's own discipline to team members from other disciplines.
 - Ask for clarifications from other team members when concepts and methods from other disciplines are not clear or familiar.
 - Check for agreement on key concepts and methods used in the team project to ensure a shared understanding.
 - Appreciate diversity in disciplinary and personal backgrounds and how they contribute to the team project.
- 4. Recognize individual qualities necessary to be successful in interdisciplinary team science.**
 - Identify the habits and attributes of effective collaborators that facilitate effective group interactions.
 - Adopt and employ habits used by effective collaborators in diverse, transdisciplinary teams.
 - Reflect on one's strengths in collaborative competencies and identify the ones that need further development.
 - Seek mentorship and mentor others regarding collaborative behaviors and habits.



- 5. Build an interdisciplinary team that is intentionally collaborative, diverse, equitable, and inclusive.**
 - Identify potential team members that represent diverse backgrounds and expertise.
 - Include team members in the research activity through collaboration in the project design, implementation, and evaluation.
 - Consider how tasks and responsibilities are administered fairly and equitably among research collaborators and participants.
 - Recognize how to leverage diverse perspectives and expertise during all project phases.
 - Create trust in interdisciplinary teams by participating in activities, listening to others, demonstrating interest, and representing other perspectives with respect.

- 6. Create a collaboration plan for an interdisciplinary team.**
 - Formulate a team vision, mission, and objectives.
 - Describe the roles and responsibilities of the team members.
 - Describe the management processes for decision-making and conflict resolution
 - Identify the communication technologies used to support team functioning
 - Identify potential outputs, including authorship and attribution policies
 - Develop a plan for implementation and maintenance of the collaboration plan



How This Course Works

This course is organized in two main sections. The first section covers the four overarching themes of the course: outcomes, diversity, communication, and leadership. The second section covers team formation, functioning, and maintenance.

The **weekly modules** in CarmenCanvas are organized as follows:

- An **overview page** that describes the learning goals and activities for that particular week.
- Links to required and recommended **readings / videos / podcasts**.
- **Addenda**: At the end of every week – before Friday midnight – you have to submit a paragraph or two (certainly no longer than one page) in which you reflect on what you learned that week from the guests, readings, assignments, and discussions. The goal of the addenda is for you to develop your own conceptual framework of interdisciplinary team science. There will be 14 addenda (and you can skip two of them).
- **Homework assignments**: There are different types of weekly homework assignments, that help you explore, develop, practice, and reflect on your interdisciplinary team skills:
 - **Psychometric assessments (PA)**: There will be a three psychometric assessments, including a motivation (MATRICx), problem-solving (FourSight), and leadership (LENA) assessment, that give you better insight in your motivations and competencies for interdisciplinary team science.
 - **Collaboration plan sections (CP)**: There will be seven weekly homework assignments in which you develop the first draft of the collaboration plan including: (1) team vision, mission, and objectives; (2) team outputs; (3) people, roles, and responsibilities; (4) team culture; (5) team processes and functioning; (6) project management and infrastructure; and (7) implementation and maintenance of the collaboration plan
 - **Reflection essays (RE)**: There are three two-page essays focused on key themes in the course, including (1) diversity, equity, and inclusion; (2) leadership; and (3) future career as interdisciplinary researcher.
- **Collaboration plan**: The capstone assignment is a collaboration plan for your (current or future) interdisciplinary science team with the following sections: (1) team vision, mission, and objectives; (2) people, roles, and responsibilities; (3) team outputs; (4) team culture; (5) team processes and functioning; (6) project management and infrastructure; and (7) implementation and maintenance of the collaboration plan. Detailed instructions will be provided in CarmenCanvas.



Expectations for graduate students.

- This course can be taken by undergraduate and graduate students. Graduate students complete all the weekly homework assignments and addenda.
- As graduate students are more advanced in their studies, they are expected to mentor and support the learning of the undergraduates enrolled in class, which entails encouraging them to participate and guiding them through the activities in class.
- In addition to the required readings, graduate students will also read recommended readings before coming to class on Tuesdays.
- In the capstone assignment, graduate students will write a collaboration plan for the current research team or for the team that they would like to lead in the future. Undergraduates will write a collaboration plan for group work in one of their classes.

Credit hours and work expectations: This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](https://go.osu.edu/credithours) (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of C average.

Course Materials

All required and recommended readings and course materials will be made available in CarmenCanvas course.

How Your Grade is Calculated

Assignment Category	Percentage
Participation	15%
Addenda	15%
Homework assignments	35%
Collaboration plan	35%
Total	100%

See [Course Schedule](#) for due dates.



Late Assignments

Please refer to CarmenCanvas for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments.

Grading Scale

Final grades are based on the following grading scheme: A 93; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; C- 70-72; D+ 67-69; D 60-66; E < 60.



Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates. **All the assignments are due before midnight.**

Week	Topic	Assignments
1	Introduction	HW1: motivation assessment (PA1)
2	Theme1: Communication	HW2: vision, mission, objectives (CP1)
3	Theme 2: Outcomes	HW3: team outputs (CP2)
4	Theme 3: Diversity	HW4: DEI reflection essay (RE1)
5	Theme 4: Leadership	HW5: leadership assessment (PA2)
6	Building teams I	HW6: people, roles, responsibilities (CP3)
7	Building teams II	HW7: problem-solving assessment (PA3)
8	Team stages	HW8: team culture (CP4)
9	Collaboration plans I	HW9: processes, functioning (CP5)
10	Collaboration plans II	HW10: leadership reflection essay (RE2)
11	Conflict resolution I	HW11: management, infrastructure (CP6)
12	Conflict resolution II	HW12: implementation, maintenance (CP7)
13	Collaborations outside academia	HW13: team science elevator pitch
14	Assessment	HW14: career reflection essay (RE3)
Finals		Capstone: Collaboration plan



Required readings

All the required readings are available in weekly modules in CarmenCanvas.

Bennett, L. M., H. Gadlin, and S. Levine-Finley. 2018. *Collaboration and team science: A field guide*. Bethesda (MD): National Institutes of Health.

Cooke, Nancy J., and Margaret L. Hilton, eds. 2015. *Enhancing the Effectiveness of Team Science*. Edited by Committee on the Science of Team Science, C. Board on Behavioral, and Sensory Sciences, , Division of Behavioral and Social Sciences and Education and National Research Council. Washington DC: National Academies Press.

Currie, Margaret, Christopher (Kit) J. A. Macleod, Annemarieke de Bruin, Carly Maynard, Gabriele Bammer, Laura Meagher, Alister Scott, Mark Reed, and Colin Campbell. 2016. Working together for better outcomes: good practice for interdisciplinary researchers. In *Working Together for Better Outcomes*. Edinburgh, UK.

DeHart, Dana. 2019. Team science: A qualitative study of benefits, challenges, and lessons learned. *The Social Science Journal* 54 (4):458-467.

Graef, Dana J., Jonathan G. Kramer, and Nicole Motzer. 2021. *Facilitating Interdisciplinary Meetings: A Practical Guide*. Annapolis, MD: National Socio-Environmental Synthesis Center (SESYNC).

Hall, Kara L., Kevin Crowston, and Amanda L. Vogel. 2014. How to Write a Collaboration Plan.

Hall, K. L., A. L. Vogel, G. C. Huang, K. J. Serrano, E. L. Rice, S. P. Tsakraklides, and S. M. Fiore. 2018. The science of team science: A review of the empirical evidence and research gaps on collaboration in science. *Am Psychol* 73 (4):532-548.

Hall, Kara L., Amanda L. Vogel, and Robert T. Croyle, eds. 2019. *Strategies for Team Science Success: Handbook of Evidence-Based Principles for Cross-Disciplinary Science and Practical Lessons Learned from Health Researchers*. Cham (Switzerland): Springer Nature.

Hardavella, G., A. Aamli-Gagnat, N. Saad, I. Rousalova, and K. B. Sreter. 2017. How to give and receive feedback effectively. *Breathe (Sheff)* 13 (4):327-333.

Harro, B. 2000. The Cycle of Socialization. In *Readings for Diversity and Social Justice*, edited by M. Adams: Routledge.

Lotrecchiano, G. R., T. R. Mallinson, T. Leblanc-Beaudoin, L. S. Schwartz, D. Lazar, and H. J. Falk-Krzesinski. 2016. Individual motivation and threat indicators of collaboration readiness in scientific knowledge producing teams: a scoping review and domain analysis. *Heliyon* 2 (5).

Lotrecchiano, G. R., L. Schwartz, and H. J. Falk-Krzesinski. 2020. Measuring motivation for team science collaboration in health teams. *J Clin Transl Sci* 5 (1):e84.



Mariotti, Sergio. 2021. A new alliance between the natural and human sciences. In *Integration and implementation insights*.

Mojica Rey, Camille. 2008. Team Science and the Diversity Advantage. *Science*.

Philips, Katherine W. 2017. What is the real value of diversity in organizations? Questioning our assumptions. In *The diversity bonus: How great teams pay off in the knowledge economy*, edited by S. E. Page. Princeton (NJ): Princeton University Press.

Rolland, B., and J. D. Potter. 2017. On the Facilitation of Collaborative Research: Enter Stage Left, the Consortium Director. *Cancer Epidemiol Biomarkers Prev* 26 (11):1581-1582.

Smith-Doerr, Laurel, Sharla N. Alegria, and Timothy Sacco. 2017. How Diversity Matters in the US Science and Engineering Workforce: A Critical Review Considering Integration in Teams, Fields, and Organizational Contexts. *Engaging Science, Technology, and Society* 3.

Tuckman, Bruce W. 1965. Developmental sequence in small groups. *Psychological Bulletin* 63 (6):384-399.

Wolfe, A. D., K. B. Hoang, and S. F. Denniston. 2018. Teaching Conflict Resolution in Medicine: Lessons From Business, Diplomacy, and Theatre. *MedEdPORTAL* 14:10672.

Zeng, A., Y. Fan, Z. Di, Y. Wang, and S. Havlin. 2021. Fresh teams are associated with original and multidisciplinary research. *Nature Human Behavior* x (x):xx-xxx.



Instructor Feedback and Response Time

Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **48 hours during week days when class is in session at the university**.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date may have reduced feedback, and grades may take longer to be posted.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at go.osu.edu/student-tech-access.

CarmenCanvas Access

You will need to use [BuckeyePass](http://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](http://go.osu.edu/add-device) (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- [Install the Duo Mobile application](http://go.osu.edu/install-duo) (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

Technology Skills Needed for this Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](http://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)



- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** go.osu.edu/it
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu



Other Course Policies

Land Acknowledgement

the Ohio State University acknowledges that its campuses have long served as sites of meeting and exchange for Indigenous peoples, including those in historical times known as the Shawnee, Potawatomi, Miami, Wyandotte, Delaware, and the People of Fort Ancient, Hopewell, and Adena cultures also known as the earthworks builders, as well as other tribal nations of the region. The Ohio State University resides on land ceded in the 1795 Treaty of Greenville and the forced removal of tribes through the Indian Removal Act of 1830. I honor the resiliency of these tribal nations and recognize the historical contexts that has and continues to affect the Indigenous people of this land. *In addition, we acknowledge that over 614,000 acres of traditional Indigenous Peoples land were purchased, seized, or stolen by the U.S. Congress following the 1862 Morrill Land Grant Act. These lands produced a 10-fold profit for the development of United States public institutions, from which The Ohio State University was made possible in 1870.* <https://www.landgrabu.org/universities/ohio-state-university>

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the CarmenCanvas discussion.

Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](http://studentconduct.osu.edu) (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and



honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

Copyright Disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Student Well-Being

The well-being of students is of primary importance. If you are facing any challenges related to your physical or mental health, or obstacles like food or housing insecurity, please do not hesitate to get in touch to discuss ways we can put you in the best possible position to succeed.



Title IX Statement

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. any human resource professional (HRP); 2. anyone who supervises faculty, staff, students, or volunteers; 3. chair/director; and 4. faculty member.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is

closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://www.nationalsuicideline.org) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](https://slds.osu.edu). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services.

Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](https://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](https://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

