# INTEGRATED SCIENCE (INTEGSCI)

**INTEGSCI 100 – EXPLORING BIOLOGY**
2 credits.

A first-year course focused on the core concepts in biology (evolution; transformation of energy and matter; information exchange and storage; structure and function; systems biology), professions in biology, and the foundational skills and knowledge needed for successful academic and post-graduate careers in biology.
**Requisites:** First year students or first year transfer students only
**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Fall 2024
**Learning Outcomes:** 1. Identify and describe the five core concepts of biology (Evolution (E), Pathways and Transformations of Energy and Matter (PTEM), Information Flow, Exchange, and Storage (IFES), Structure and Function (SF), and Systems (S)).
Audience: Undergraduate

2. Apply the biology core concepts from molecular to ecological scales.
Audience: Undergraduate

3. Gain skills in scientific thinking, including asking questions, interpreting data, evaluating claims, communicating science, and reading scientific literature.
Audience: Undergraduate

4. Appreciate the importance of diversity and inclusion in science, including how a diversity o individuals promotes a richer understanding of science and makes scientific research more equitable.
Audience: Undergraduate

5. Identify how biologists contribute to society and how the people of WI are impacted by biology.
Audience: Undergraduate

6. Explore the breadth of careers related to biology.
Audience: Undergraduate

7. Become familiar with campus resources and opportunities to help you thrive as a STEM student at UW-Madison.
Audience: Undergraduate

**INTEGSCI 110 – BIOHOUSE SEMINAR: BIOLOGY FOR THE 21ST CENTURY**
1 credit.

Focused on developing skills in cooperative learning with peers and visiting scientists; integrating information across disciplines; communicating science; careers in biology; and, illustrating how biology can help solve society's pressing issues.
**Requisites:** Member of BioHouse Residential Learning Community
**Repeatable for Credit:** No
**Last Taught:** Fall 2024
**Learning Outcomes:** 1. Describe the breadth of biology and describe where biology can be studied at UW-Madison.
Audience: Undergraduate

2. Describe how biology impacts your life and how it can improve society.
Audience: Undergraduate

3. Describe the meaning and importance of integration across disciplines and scales in biology.
Audience: Undergraduate

4. Understand the importance of effectively communicating scientific information to non-scientists.
Audience: Undergraduate

5. Identify your current interest(s) in biology and how you can get involved as an undergraduate.
Audience: Undergraduate

**INTEGSCI 140 – EXPLORING SERVICE IN STEM**
1 credit.

A discussion-based seminar introducing first-year STEM students to the world of public service from the perspective of both the university and its community partners. Classroom activities and direct campus and off-campus experiences are included. Service opportunities include STEM outreach, sustainability, and public health. Involves approximately 1 hour per week of public service.
**Requisites:** First Year Students only
**Repeatable for Credit:** No
**Last Taught:** Fall 2024
**Learning Outcomes:** 1. Develop awareness of and access to service opportunities within STEM
Audience: Undergraduate

2. Develop awareness of the relationship between the university and the community
Audience: Undergraduate

3. Develop reflective approaches to public service and community engagement.
Audience: Undergraduate

4. Explore the interactions of STEM, scientists and engineers, and society
Audience: Undergraduate

5. Recognize and honor diversity and cultural context
Audience: Undergraduate

**INTEGSCI 150 – EXPLORING RESEARCH IN STEM**
1 credit.

Offers an overview of the research process and opportunities to build skills in reading scientific literature. Understand different approaches to science and to be flexible in thinking about gathering evidence or solving problems. Supports articulation of research interests, identifying potential research mentors, and writing professional emails to secure research opportunities. Explore STEM careers and pathways that can come from engaging in research.
**Requisites:** None
**Repeatable for Credit:** No
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Read scientific literature efficiently and understand what information can be found in each section of a primary research article.
Audience: Undergraduate

2. Identify your personal research interests and find faculty members whose research interests align with yours.
Audience: Undergraduate

3. Write professional emails to potential research mentors.
Audience: Undergraduate

4. Identify disparities between majority and minority group participation in STEM careers and articulate strategies to reduce the disparities.
Audience: Undergraduate

5. Explore STEM careers and learn about the pathways to pursue those careers.
Audience: Undergraduate

**INTEGSCI 230 – EXPLORING PEER LEADERSHIP IN STEM**
2 credits.

Provides current and potential peer leaders the opportunity to reflect on and think critically about their personal goals, identities, and experiences that inform their development as a peer leader. Increase awareness and develop practical skills to promote inclusion and success for students with diverse identities, and learn how to connect students with campus and community resources.
**Requisites:** None
**Repeatable for Credit:** No
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Describe relevance of personal identities to experiences in higher education and STEM
Audience: Undergraduate

2. Identify strategies to promote inclusion for students with diverse identities, including identities that are underrepresented in STEM and higher education
Audience: Undergraduate

3. Develop peer leadership skills and relate them to the UW-Madison Leadership Framework
Audience: Undergraduate

4. Connect students with campus and community resources to support their success
Audience: Undergraduate

5. Apply knowledge and skills to be able to effectively lead your peers in various STEM contexts on campus
Audience: Undergraduate

6. Reflect on personal goals, strengths, experiences, and identities to inform your ongoing development as a student leader
Audience: Undergraduate

**INTEGSCI 240 – SERVICE WITH YOUTH IN STEM**
2 credits.

Teaches students about community engagement experiences, focusing on building community partnerships, understanding organizational missions and community needs, assessment of informal science outreach experiences, and issues related to scientific literacy and access to science.
**Requisites:** None
**Course Designation:** Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Develop leadership skills & recognize their application to multiple contexts.
Audience: Undergraduate

2. Develop competencies to work in an after-school setting with children and adult staff from a variety of cultures and backgrounds.
Audience: Undergraduate

3. Effectively facilitate the scientific thought process in a way that is age/developmentally appropriate.
Audience: Undergraduate

4. Develop and understand personal scientific identity.
Audience: Undergraduate

5. Connect community experience to personal perspectives through reflection.
Audience: Undergraduate

**INTEGSCI 260 — ENTERING RESEARCH PART 1**
1 credit.

Seminar course for sophomore or transfer students to begin independent research in science, technology, engineering or mathematics. Taken concurrently with 1-3 research credits with faculty member. Supports independent research experience.
**Requisites:** None
**Repeatable for Credit:** No
**Last Taught:** Summer 2025
**Learning Outcomes:** 1. Explore the roles, responsibilities, and relationships that make for a successful research experience.
Audience: Undergraduate

2. Define an independent research project with your mentor.
Audience: Undergraduate

3. Create a poster presentation to communicate research project findings.

Audience: Undergraduate

4. Develop your science communication skills through reading, writing, and presenting research.
Audience: Undergraduate

5. Engage in a community of undergraduate researchers at UW-Madison.
Audience: Undergraduate

6. Discuss importance of equity and inclusion in research contexts.
Audience: Undergraduate

**INTEGSCI 299 — INDEPENDENT STUDY**
1-3 credits.

Provides academic credit for research, library, and/or laboratory work under direct guidance of a faculty or instructional academic staff member. Students are responsible for arranging the work and credits with the supervising instructor.
**Requisites:** Consent of instructor
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Summer 2025

**INTEGSCI 320 — INTERNSHIP**
1-3 credits.

Provides academic credit for skill development in authentic contexts in science education including service, peer mentoring, and leadership. See class notes for additional information.
**Requisites:** Consent of instructor
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Spring 2025

**INTEGSCI 330 — PRACTICUM IN STEM PEER LEADERSHIP**
1-2 credits.

Application of leadership, mentoring, and communication skills. Includes engagement in leadership experience to support STEM student success as well as activities to enhance participants' leadership development.
**Requisites:** INTEGSCI 230
**Repeatable for Credit:** Yes, unlimited number of completions
**Learning Outcomes:** 1. Apply and refine leadership and mentorship skills to effectively support their STEM peers on campus#
Audience: Undergraduate

2. Apply strategies to promote inclusion for all students, including students with identities that are underrepresented in STEM and higher education#
Audience: Undergraduate

3. Assess student needs and connect students with campus and community resources to support their success and belonging#
Audience: Undergraduate

4. Describe how peer leader knowledge and skills relate to the UW-Madison Leadership Framework and to personal goals#
Audience: Undergraduate

5. Reflect on the significance of peer leadership and their personal development as a leader#
Audience: Undergraduate

**INTEGSCI 340 – SERVICE WITH YOUTH IN STEM II**
2 credits.

Applies communication skills and social awareness issues in ways that enable students to work with increasing levels of independence in building and maintaining community relationships compared to INTEGSCI 240. Includes a lab section applied to lecture experiences to prepare for work with children in elementary after-school science clubs and to focus on different styles of communication. The multi-disciplinary focus of the after-school lessons develops connections between students' field of study and others within STEM. In the service learning component, students apply academic knowledge through science education and outreach experiences in a community-focused and culturally sensitive way. Students work with underrepresented students in the Madison metropolitan area in elementary after-school science clubs, and are expected to critically reflect on the ties between their academic and community partnerships, and differences between campus and community culture.
**Requisites:** INTEGSCI 240
**Course Designation:** Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** No
**Learning Outcomes:** 1. communicate and collaborate with adult after-school staff members from a variety of cultures and backgrounds.
Audience: Undergraduate

2. independently design informal educational science experiences for youth.
Audience: Undergraduate

3. assess appropriate strategies for designing developmentally appropriate science lessons.
Audience: Undergraduate

4. describe the importance of communication and distinctions between informal and technical communication.
Audience: Undergraduate

5. critically reflect on experiences in the community and connect these experiences broadly to service learning, scientific literacy, and cultural context.
Audience: Undergraduate

**INTEGSCI 341 – SERVICE WITH YOUTH IN STEM PRACTICUM**
1 credit.

Apply communication, cultural competency, and leadership skills to work with community partners in a service learning practicum. Work with underrepresented students in the Madison metropolitan area in elementary after-school science clubs, and critically reflect on the ties between their academic and community partnerships, and differences between campus and community culture. Work with different community partners than they did in previous Service with Youth in STEM courses. This practicum combines the service experience with an in-class component to prepare to provide opportunities to critically reflect upon the ties between academic preparation and community partnerships, and on their experiences in varied community settings.
**Requisites:** INTEGSCI 340
**Course Designation:** Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Encourage interaction between scientists and community members from a variety ages and backgrounds
Audience: Undergraduate

2. Experience working with community organizations that have different missions and serve different populations than students' previous participation in community relationships
Audience: Undergraduate

3. Continue to develop mutually beneficial relationships between the University and the community
Audience: Undergraduate

4. Deepen their understanding of diverse social factors that impact youth development, participation, and education
Audience: Undergraduate

5. Critically reflect on experiences in the community and connect these experiences broadly to service learning, cultural context, and similarities and differences in working with different community groups
Audience: Undergraduate

**INTEGSCI 375 – SPECIAL TOPICS IN INTEGRATED SCIENCE**
1-3 credits.

This course examines various special topics in science or science education. See class notes for additional information. Requisites vary by topic
**Requisites:** None
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Spring 2025

**INTEGSCI 605 – SCIENTIFIC TEACHING FOR TAS**
1 credit.

The goal of this course is to arm Teaching Assistants with survival skills in scientific teaching through theory, practice, and learning community. We will work together to learn the core themes of scientific teaching (active learning, assessment, and diversity) and apply them, in real time, to the courses in which the TAs are concurrently teaching. This course is open to graduate students only.
**Requisites:** Consent of instructor
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Fall 2021
**Learning Outcomes:** 1. Explain the core ideas of Scientific Teaching (active learning, assessment, and diversity) and how they benefit instructors and students.
Audience: Graduate

2. Develop community with colleagues around interest and shared experience in teaching.
Audience: Graduate

3. Reflect on TA role and how TAs support student learning and success.
Audience: Graduate

4. Apply evidence-based and inclusive instructional practices in teaching.
Audience: Graduate

**INTEGSCI 640 – PUBLIC SERVICE IN STEM**
1 credit.

Discusses the fundamentals of public service and civic engagement in the STEM (science, technology, engineering, and math) disciplines grounded in evidence-based knowledge and research. Provides an overview of the core pathways of public service, the knowledge required to effectively initiate and cultivate community partnerships, and the skills necessary to reflect upon personal experiences with community engagement activities. Fosters understanding of the broader impacts in STEM fields and prepares students to begin specializing in a specific pathway and develop relationships with a community partner.
**Requisites:** Consent of instructor
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Develop knowledge, skills, and values that support their engagement with the community from a scholarly perspective.
Audience: Graduate

2. Develop an ethical and sustainable approach to building community relationships.
Audience: Graduate

3. Build reflective process and metacognitive skills into community engagement practices to inform personal development.
Audience: Graduate

4. Develop community as a cohort around shared interest and experience in community engagement.
Audience: Graduate

5. Identify and critique ways that STEM and society interact in diverse contexts.
Audience: Graduate

6. Develop a personal approach to creating a culturally responsive, inclusive environment in campus and community spaces.
Audience: Graduate

**INTEGSCI 650 – COLLEGE SCIENCE TEACHING**
1-2 credits.

Fundamental principles for teaching college-level science courses, with an emphasis on research-based and inclusive approaches. Learn core themes of scientific teaching (active learning, assessment, and diversity) and connect them to practical strategies for designing and implementing courses in their discipline in the future. Develop competence and confidence as college science teachers.
**Requisites:** Consent of instructor
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Spring 2025
**Learning Outcomes:** 1. Explain the core ideas of Scientific Teaching (active learning, assessment, and diversity) and how they benefit instructors and students.
Audience: Graduate

2. Design and implement instructional units for college courses based on Scientific Teaching principles.
Audience: Graduate

3. Find and utilize resources to support teaching and learning.
Audience: Graduate

4. Apply reflective practice and metacognitive skills to inform personal teaching development.
Audience: Graduate

5. Develop community with colleagues around interest and shared experience in teaching.
Audience: Graduate

**INTEGSCI 660 – RESEARCH MENTOR TRAINING PRACTICUM**
1 credit.

Practicum course for graduate, post-doctoral or senior undergraduate students to be taken concurrently while mentoring an undergraduate engaged in an independent research experience.
**Requisites:** None
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Summer 2025
**Learning Outcomes:** 1. Explore multiple strategies for effective mentoring with case studies, discussions, and readings.
Audience: Undergraduate

2. Compare mentor and mentee goals, and craft a statement of your mentoring philosophy.
Audience: Undergraduate

3. Explore time-management strategies, and discuss relevant issues as they come up.
Audience: Undergraduate

4. Collaborate and problem-solve with a group of peers.
Audience: Undergraduate

**INTEGSCI 675 – SPECIAL TOPICS**
1-3 credits.

This course examines various special topics in science or science education. See Class Notes for additional information.
**Requisites:** Graduate/professional standing
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Fall 2024

**INTEGSCI 699 – INDEPENDENT STUDY**
1-3 credits.

Provides academic credit for advanced research, library, and/or laboratory work under direct guidance of a faculty member. Students are responsible for arranging the work and credits with the supervising faculty member.
**Requisites:** Consent of instructor
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Fall 2024

**INTEGSCI 740 – COMMUNITY RELATIONSHIPS AND MATERIALS DEVELOPMENT IN STEM PUBLIC SERVICE**
1 credit.

Provides opportunities for practical application of public service knowledge. Discusses development of a workplan for long-term projects, provides strategies to initiate community partnerships, and fosters development of materials for use in a community-based practicum. Includes time to work intensively on acquiring pathway-specific knowledge and skills and opportunities to practice, problem-solve, and support cohort members within and across public service pathways.
**Requisites:** INTEGSCI 640
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Summer 2025
**Learning Outcomes:** 1. Apply their knowledge of approaches to community partnerships to the development of personal and organizational relationships
Audience: Graduate

2. Develop pathway-specific materials in collaboration with peers and community partners that appropriately engage stakeholders in STEM, are inclusive, and grounded in evidence
Audience: Graduate

3. Develop pathway-specific knowledge, skills, and attitudes
Audience: Graduate

**INTEGSCI 750 – INSTRUCTIONAL MATERIALS DESIGN FOR COLLEGE SCIENCE TEACHING**
1 credit.

Designed to provide a practical application of pedagogical knowledge through the development of instructional materials for use in a university science education context. The process will be based around cohorts of participants working together to identify learning objectives, and create evidence-based assessments and learning experiences to target those objectives. This course is required for Scientific Teaching Fellows Program participants.
**Requisites:** INTEGSCI 650
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** Yes, unlimited number of completions
**Last Taught:** Summer 2025

**INTEGSCI 840 – MENTORED PRACTICUM IN STEM PUBLIC SERVICE**
1 credit.

Develops community-engagement in STEM (science, technology, engineering, and math) through a mentored public service experience. Provides opportunities to refine and implement skills necessary to work with a community partner to implement and evaluate a project that is mutually beneficial in process and product. Places emphasis on professional development within a selected pathway (direct service, community engaged teaching, policy and governance, or social entrepreneurship/corporate social responsibility). Includes time to meet within specialized pathways and as a full cohort throughout the implementation of the practicum experience.
**Requisites:** INTEGSCI 740
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Fall 2024
**Learning Outcomes:** 1. Conduct an effective public service practicum in their public service pathway of specialization
Audience: Graduate

2. Develop and exhibit a sense of professional identity as a community engagement professional
Audience: Graduate

3. Strengthen civic leadership and advocacy skills
Audience: Graduate

4. Reflect on the practicum experience and use this experience to inform future community engagement
Audience: Graduate

**INTEGSCI 850 – MENTORED PRACTICUM IN COLLEGE SCIENCE TEACHING**
1 credit.

Continues the development of graduate student's skills in teaching and learning college science courses by providing a mentored, independent teaching experience. Participants will have the opportunity to see how theories of learning and teaching play out in real instructional settings by implementing instructional activities and then evaluating the outcomes of those activities on the basis of student artifacts. A particular emphasis will be placed on participants creating an inclusive learning environment for teaching diverse student populations. The course also provides participants with frameworks for teaching and managing their own courses, should they pursue academic positions after graduate school. This course is required for Scientific Teaching Fellows Program participants.
**Requisites:** INTEGSCI 750
**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement
**Repeatable for Credit:** No
**Last Taught:** Fall 2024