

Science Teacher Education



“Engaging students in the messy and involved work of developing empirically-based explanations not only teaches students about the phenomenon they are studying but also opens the door to essential lessons about how scientific knowledge is constructed and critiqued.”

~ April Luehmann, Ph.D.
Program Director,
Get Real! Science

Everyone who loves science had an experience like this early in life: An encounter with a teacher, family member, book or even a TV show that made science exciting. An exposure to someone who loved and taught science well.

This is your invitation to become that person for hundreds of other young people.

Somewhere along the way, you discovered that learning science was more than memorizing facts and procedures. It was something intrinsically fascinating. At Warner, we believe that proper preparation can be the key to sharing that fascination with others and to educating the next generation of scientists and scientifically literate citizens.

It is no surprise that science education has become a national priority. Our world faces complex environmental changes that will require good science to solve and to understand. The national economy hinges on technology and scientific innovation.

If you want to be part of something bigger and take on a career that really matters, become a science teacher. And if you want to become a remarkable teacher, consider the Warner School of Education. Warner is a place for people who want and expect a more rigorous, thoughtful, and experience-based professional education. You will do far more than simply learn to teach. You will be challenged by professors who themselves are nationally recognized in their fields. You will do research that enlightens you on the best approaches to teaching. And you will have exciting, unique opportunities to test your learning in classrooms and alternative learning environments.

For science teachers, Warner also presents a unique and beneficial setting. We are part of the University of Rochester, a leading center of science research that was recently named one of the “New Ivies” by *Newsweek*. Here, you will be steeped in an environment that brings great science and great teaching together, to provide you the very best path to making a positive difference in the world.



WARNER
SCHOOL OF EDUCATION
UNIVERSITY OF ROCHESTER

For more information, please contact the Warner School at (585) 275-3950 or visit www.rochester.edu/warner.



Get Real! Science

Get Real! Science is a teacher preparation program designed to engage students in real science through an inquiry-based approach. This 15-month science teacher preparation graduate program is grounded in authentic experiences and consists of the following unique features:

Experience Scientific Inquiry as Learners

Students have the opportunity to experience what it is like to learn science through inquiry by looking at real scientific problems as scientists would. Students think deeply about the nature of science and engage in real scientific questions while preparing to teach it.

Experience Scientific Inquiry as Teachers

Field experiences are carefully sequenced to support students in their development as a science teacher. Starting with non-traditional, highly supportive, authentic inquiry-based teaching and learning experiences, teachers learn how to create plans and projects to lead students in exciting research, experimentation, and discovery. As students move into the traditional classroom environment, they apply this knowledge and learn to teach effectively within the contexts of schools, standards, and accountability.

Experience Community and Build Identity

Participants engage in rich, structured, ongoing opportunities to reflect on and make sense of their experiences of reform-based education in a community of other science educators. These activities support participants in developing a sense of professional identity through reflection and interaction with various communities (kids, colleagues, peers, and professors).

Experience Equity and Inclusion

Get Real! Science is committed to issues of equity and inclusion. Many efforts are focused on students in under-resourced school districts and people who are typically under-represented in science. Get Real! aims to



give children from all backgrounds a chance to use real scientific tools in authentic problems with the committed adult attention and support.

Featured Experiences

The Get Real! Science program features some very powerful experiences that include:

Get Real! Environmental Action Camp

As part of the Integrating Science and Technology course, students organize and lead a week-long summer camp for middle school students. The students become scientists and investigate the serious water-quality issues at Rochester's Charlotte Beach. Wearing chest-high hip waders and using secchi disks and other equipment, middle school campers work during the morning sessions to collect water samples at the lakeshore and then test them in laboratories on the University of Rochester's campus.

Science STARS

In the fall, students support a science club of middle-school girls at Rochester's Wilson Academy. The Science STARS—Students Tackling Authentic and Relevant Science—meet each week and design their own experiments to find answers to real science questions that they are curious about.

Science Faculty Advisors



April Luehmann, Assistant Professor (Ph.D., University of Michigan) – Get Real! Science is the brainchild of Luehmann, who directs the program. She completed graduate degrees in science education and industrial

and operations engineering, and previously taught mathematics and science to secondary school students. Luehmann was recently awarded with the prestigious Knowles Science Teaching Foundation Young Scholars Fellowship and is director of science education for the www.iwaswondering.org, an imaginative science Web site created by the National Academy of Sciences.



Al Schademan, Visiting Assistant Professor (Ph.D. candidate, University of Rochester) – Schademan taught middle school science and environmental education for ten years in both public and private schools. His research inter-

ests focus on learning and development as youth engage in cultural practices, with a focus on mathematics and science learning.

In addition, experienced teachers complement the faculty advisors by playing an active role in the internship experiences.



New York State Teaching Certifications

To teach science in secondary schools in New York State, you need to obtain at least one of the following NYS teaching certifications:

- *Adolescence Education (grades 7-12) as a specialist in biology, chemistry, physics or earth science*

A master's degree is also eventually required. Our Warner science teacher preparation program will provide you with all the coursework needed to apply for any of these certifications as part of a master's degree. Provided you have the necessary content background, our program also allows you to pursue more than one certification at the same time and with minimal additional credits.

Core Program Components

The core science teacher preparation program leading to teaching certification for one subject area in grades 7-12 includes 30 credits of coursework and 9 credits of internships.

Pedagogical Core

These courses address: the context of schooling within which teachers operate; contemporary issues and topics in education, including assessment and evaluation, conflict resolution, law and ethics, and school and community relations; diversity and equity in education; disability and inclusion: the nature of language practices and literacy learning in classrooms; and understanding your student populations.

- ED 400: Topics in Teaching & Schooling
- ED 404: Teaching, Curriculum & Change
- ED 415: Adolescent Development and Youth Culture

- EDU 442: Race, Class, Gender & Disability in American Education
- ED 447: Disability & Schools
- EDU 498: Literacy Learning as Social Practice

Science Specialization

It is through the specialized science education courses and internships that you experience the Get Real! Science program.

- EDU 487: Integrating Science and Literacy
- EDU 434: Theory & Practice in Teaching & Learning Science
- EDU 448: Implementing Innovation in Science Education
- EDU 486: Integrating Science and Technology

Internships are done concurrently with the coursework as follows:

- Field experiences (minimum of 100 hours; Fall) – taken concurrently with EDU 434
- First and second student teaching experiences (4 and 8 weeks full time, respectively; Spring) – taken concurrently with EDU 448

Program Options/Extensions

In addition to the core program outlined above, students may want to consider supplementing their program to achieve other goals and pursue additional certifications.

Inclusion/DUAL Certification Program

To obtain NYS certification for Teaching Students with Disabilities in addition to your basic certification, four additional inclusion courses (12 credit hours) are needed. Internships need to be conducted in an inclusive setting.

Grades 5-6 Extension

By adding one or two courses, you can extend your certification to teach science in grades 5 and 6.

M.A.T. (Master of Arts in Teaching) Program

If you are interested in pursuing teaching certification while strengthening your subject area knowledge, you may obtain an M.A.T., which involves an additional 12 credit hours of coursework in your science specialization.

Urban Teaching and Leadership (UTL) Program

Students interested in urban teaching may want to consider the UTL program where students take nine additional credit hours and participate in a series of experiences as part of an Urban Education Concentration.

Core Program at a Glance

Full-time students starting in the summer can complete the core science teacher preparation program in 15 months. Students starting at a different time, doing some of the program on a part-time basis or adding additional certifications, will take longer.

Recommended Sequence

Summer 1 (12 credits):

- Integrating Science & Literacy
- Literacy Learning as Social Practice
- Integrating Science & Technology
- Teaching, Curriculum & Change

Fall (12 credits):

- Theory & Practice in Teaching & Learning Science
- Disability & Schools
- Adolescent Development and Youth Culture
- Topics in Teaching & Schooling (part 1)
- Field experiences

Spring (12 credits):

- Implementing Innovation in Science Education
- Topics in Teaching & Schooling (part 2)
- First & second student teaching experiences

Summer 2 (3 credits):

- Race, Class, Gender & Disability in American Education

SCIENCE TEACHER EDUCATION

PREREQUISITES

To enter one of our science teacher preparation program you need:

- A bachelor's degree with a liberal arts or science major,
- At least 30 hours of coursework in the sciences, of which at least 18 credit hours need to be in each of the subject areas for which you are seeking teaching certification (i.e., biology, chemistry, physics or earth science),
- Two courses in a language other than English (or equivalent).

Frequently Asked Questions

What do I do if I do not know if I qualify with the necessary prerequisites?

Sometimes students have applied science backgrounds (such as nursing or engineering) that make it difficult to evaluate whether you have the required prerequisites. If you have any questions as to whether you have all the prerequisites to enter the program, please contact the Admissions Office.

Can I still apply to the program if I do not have all the necessary prerequisites?

If you are short just a couple of courses, you can still apply and may be admitted into our program, although you will have to complete all your prerequisites in order to graduate. If you need to complete several of the prerequisite courses, we recommend that you take the time to fulfill these requirements before applying, but you are welcome to schedule an appointment with one of our admissions counselors for advice on how to best do this.

How can I pursue certification in more than one science?

Since the coursework is identical regardless of the science you are seeking certification in, you can concurrently seek certification in any of the four sciences for which you have at least 18 credits of coursework. The one additional requirement is that you conduct an additional field experience (for a minimum of 50 additional hours and 2 credits) for each of the additional sciences that you are seeking certification.

Can I do the program part time?

You can start your program as a part-time student; however, you need at the very least to commit to full-time studies for the Spring semester when you will be conducting your student teaching experiences.

Can I transfer courses into this program?

If you have taken any of the required courses at the Warner School prior to matriculating into the program, they will automatically count towards your degree. Any other transfer credit questions will be addressed on a one-on-one basis.

Can I start the program in the fall as a full-time student?

While in special circumstances we may allow you to start the program in the fall and complete it by the following summer, we do not recommend this option, as it will involve taking some of the key courses and experiences out of sequence as well as requiring you to take an overload in the fall semester.

Scholarships

The Warner School is committed to assisting qualified students finance their graduate study in education. In 2006-07, the Warner School awarded over \$1 million in scholarships and assistantships in recognition of our students' academic excellence, professional accomplishment, and leadership in their fields, and to ensure a diverse student body.

Over the next three years, through funding from the National Science Foundation, the Warner School has 30 full scholarships available for math and science teacher candidates. Noyce Scholars will be expected to make a commitment to teaching for at least two years in a high-need school, helping to share their passion for science or math and inspiring other students to follow in their footsteps.

Additional information is available at www.rochester.edu/warner.

For additional information on scholarships and eligibility, please contact the Admissions Office.

Admissions:

Applications are available online at www.rochester.edu/warner/admissions/WS_app.pdf.

Admission deadlines are November, February, April, and July. Cohorts begin every summer.

This information bulletin was prepared on the date indicated below, and the information is subject to change. Please consult www.rochester.edu/warner for updates on programs, courses, and requirements.

Publication date:
October 1, 2007



WARNER
SCHOOL OF EDUCATION
UNIVERSITY of ROCHESTER

For more information, please contact the Warner School at (585) 275-3950 or visit www.rochester.edu/warner.