



**EAST QUAD**

- 1 FARRELL HALL**  
Academic Affairs  
Advancement  
(Alumni, University Relations)  
Classrooms  
Finance  
Human Resources  
Information Systems  
Learning Resource Center  
Br. Edmond Drouin Library  
Office of the President  
Student Service Center  
(Financial Aid, Registrar, Student Billing)

- 2 OUR LADY OF PERPETUAL HELP CHAPEL**
- 3 TIMKEN NATURAL SCIENCES CENTER**  
Bioinformatics  
Classrooms/Labs  
Faculty Offices

- 4 AULTMAN HEALTH FOUNDATION HEALTH SCIENCES CENTER/ THE DON & IDA BETZLER SOCIAL AND BEHAVIORAL SCIENCES CENTER**  
Betzler Auditorium  
Classrooms/Labs  
Faculty Offices  
Graduate Studies

- 5 THE BARRETTE BUSINESS AND COMMUNITY CENTER**  
Auxiliary/Special Services  
Betzler Grille  
Business Division  
Classrooms  
Br. Robert Francoeur Conference Center  
Leadership Institute  
School for Professional Studies

- 6 LA MENNAIS HALL**  
Brothers of Christian Instruction Residence  
Faculty Offices

**WEST QUAD**

- 7 THE PAUL & CAROL DAVID FAMILY CAMPUS CENTER**  
Admissions • Bookstore • Career Development  
Cavallier Cafe • DeVille Atrium  
Founders Room • Multi-Purpose Room  
Post Office • Schervish Dining Centre  
Sodexho Food Services • Student Affairs

- 8 HANNON CHILD DEVELOPMENT CENTER**  
Classrooms/Labs  
Faculty Offices

- 9 RESIDENCE HALL COMPLEX**  
(A) Alexis Hall (B) Lemmon Hall  
(C) Menard Hall  
(D) Marie & Ervin Wilkof Towers  
(E) Towers II (F) Brauchler Hall  
(G) Meier Hall (H) Stein Hall
- 10 PHYSICAL EDUCATION CENTER**  
Athletic Offices • Gymnasium  
Health and Wellness Complex

- 11 TUNNEL to ATHLETIC FIELDS**
- 12 HOOVER HISTORICAL CENTER and HOOVER PARK**



The Ohio Environmental Science  
& Environmental Engineering  
**SCHOLARSHIP PROGRAM**  
<http://ohiosci.org/oeeef-scholarship/>



## APPLICATION

**Deadline: Mail First Class. Postmarked by May 1, 2014 for 2014-2015 school year**

\$1,250 two year programs and \$2,500 for four or five year programs, non-renewable

**T**HESE MERIT BASED, nonrenewable, scholarships will be given to undergraduate students admitted to Ohio state or private colleges and universities who can demonstrate their knowledge and commitment to careers in environmental sciences or environmental engineering. Students must be in the final year of the program by the autumn term. Awardees will be selected by an Academy appointed panel using a blind review process. Scholarships may be used for tuition, fees, books, personal protection equipment, tools, instruments and field equipment but not housing.

### Page 1 of 2

1. Check Title  Ms.  Mr.
2. First \_\_\_\_\_ 3. Middle \_\_\_\_\_ 4. Last \_\_\_\_\_
5. Home Address \_\_\_\_\_
6. City \_\_\_\_\_ 7. State \_\_\_\_\_ 8. Zip \_\_\_\_\_
9. EMAIL \_\_\_\_\_ 10. Home # (\_\_\_\_) \_\_\_\_\_ 11. Social Security # \_\_\_\_\_
12. Year in school by autumn term:  2nd  4th  5th
13. College or University \_\_\_\_\_
14. Academic major \_\_\_\_\_ 15. Expected graduation date \_\_\_\_\_
16. Advisor's full name \_\_\_\_\_ 17. Office Phone (\_\_\_\_) \_\_\_\_\_
18. If selected, are you willing to participate in annual follow-up surveys for three years after receipt of a scholarship?  YES  NO
19. May the Academy release your name and resume to potential employers?  YES  NO

**PLEASE ATTACH APPROPRIATE  
SUPPORTING INFORMATION TO RESPOND TO THE FOLLOWING:**

20. Academic record with an overall GPA of at least 3.0. Your current GPA \_\_\_\_\_ on a 4.0 system. Please attach a current (full) transcript and circle the GPA. Transcript must include all courses taken to-date. Enclose an "OFFICIAL" transcript (that may be sealed) with your original signed application and unofficial copies in the 6 identical sets. Alternatively, attached a single sealed transcript to your original signed application.
21. Attach a **maximum** two page vita, biosketch, or resume that includes the following elements, in this order: complete contact information, education, employment and/or internships (basic information only), honors/awards, professional memberships, publications (full citation), presentations given and professional meetings attended, and community service.

**Continued on page 2**

Page 2 of 2

22. Repeat First and Last Name \_\_\_\_\_

### **Applicants from four-year colleges:**

Each of the following essays **may not exceed** one two-sided page, double spaced, 12 point font, 1" margins.

23. Attach an essay (not exceeding one two-sided page, double spaced, 12 point font, 1" margins) to describe your reasons for choosing a career in environmental science or environmental engineering and how this scholarship will help you.

24. Attach an essay detailing any original research, scholarship, employment and/or internships, or other unique contributions to environmental science or environmental engineering.

25. Attach an essay describing your extracurricular activities and participation in organizations that demonstrate your leadership and interpersonal skills and social responsibility.

### **Applicants from two-year colleges:**

Please combine your response to requirements 23, 24 and 25 into a single essay that covers as many of the points as possible with the length not to exceed three two-sided pages, double spaced, 12 point font, 1" margins.

26. Attach two letters of recommendation from education or environmental professionals, addressed to Scholarship Review Committee. One must be from a faculty member at your institution.

27. Amount Requested \$ \_\_\_\_\_ 28. Date needed \_\_\_\_\_

Maximum: \$1,250 for two year programs and \$2,500 for four or five year programs, non-renewable.

Scholarship checks will be sent to the college financial aid office. All applicants will be notified of the scholarship recipients.

I certify that all information provided is true and accurate, I authorize independent verification, and I understand that if awarded a scholarship, information contained in this application may be released to the media.

29. SIGNATURE \_\_\_\_\_ 30. DATE \_\_\_\_\_

Please enclose a self-addressed, stamped postcard to acknowledge receipt of your application.

QUESTIONS? Phone (614) 488-2228 • Email [info@ohiosci.org](mailto:info@ohiosci.org)  
<http://www.OHIOSCI.org>

### **MAIL FIRST CLASS postmarked by May 1, 2014:**

a complete, original signed copy with stapled attachments  
plus 6 identical, two-sided, collated and stapled copies.  
(Please do not bind in a folder or cover) Submit 7 total sets.

**Environmental Science Scholarships**  
**The Ohio Academy of Science**  
**PO Box 12519**  
**Columbus OH 43212-0519**

# BioOhio

BioOhio is a membership organization, with over 420 members, that builds and accelerates bioscience industry, research, and education in Ohio.

**BioOhio Student Memberships are only \$30.** Get connected to leading bioscience companies, academic institutions, researchers, entrepreneurs, and fellow students across Ohio.

Benefits include discounted rates to events, seminars, conferences, as well as excellent networking to position yourself for the future!

Visit [BioOhio.com/Membership](http://BioOhio.com/Membership) to learn more and join today!



## Bioscience is Growing in Ohio ...and Needs You!

From life-saving therapies and procedures, to healthier foods or cutting-edge research, you have undoubtedly enjoyed a better quality of life because of bioscience.

Bioscience companies need to build their workforce. That's where you come in.

If you like science and math, working in teams to solve problems and improving people's lives – then bioscience may be a good fit for you. While research scientists are an important part of the industry, it's not just about the white coats. There are workers making the medical devices and drugs of tomorrow, a sales force to market them, technicians keeping the production lines running, and transportation experts to get products to market.

***BioOhioWorkforce.org*** - Your online career resource center! Learn about bio career paths, skill sets, wages, and Ohio universities & colleges offering bio programs.

***OhioBioscience.com*** - From cutting edge pharmaceuticals, manufacturing medical implants, designing new devices, researching cures and therapies, it's all happening here in Ohio!

1275 Kinnear Road, Columbus, Ohio 43212 (614) 675-3686 [BioOhio.com](http://BioOhio.com)



# BELIEVE IN OHIO

Curiosity • Discovery • Innovation  
**ENTREPRENEURSHIP**

**Nearly \$2 million in awards and scholarships**

**O**HIO'S HIGH SCHOOL STUDENTS will compete for nearly \$2 million in awards and scholarships during the 2014-2015 school year from a STEM commercialization and business plan competition. The program also will:

- Sponsor regional STEM commercialization and entrepreneurship forums for students, teachers, and parents.
- Support a real-world student mentor program and
- Offer online courses for students and teachers through iTunes U and regional websites featuring an extensive array of STEM research, development and entrepreneurship programs.

## **FIND OUT HOW TO PARTICIPATE...**

<http://BelieveinOhio.org/> • [BelieveinOhio@ohiosci.org](mailto:BelieveinOhio@ohiosci.org)

614.914.5095

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Entitled *Believe in Ohio—A STEM Bridge to Ohio's Innovation Economy of the Future*, the program was developed by The Ohio Academy of Science and Entrepreneurial Engagement Ohio with support from NorTech, The Ohio General Assembly and The Ohio Board of Regents.

An online fill-in form is available at <http://www.ohiosci.org/am-registration>

THE OHIO ACADEMY OF SCIENCE

**Registration Form**  
123rd Annual Meeting  
April 5th, 2014  
Walsh University

**Advance registration must be received by March 28, 2014**

ALL MEETING ATTENDEES MUST REGISTER: Access to sessions by name tag only. Name tag, information packet and receipt will be available at the meeting. Please return the completed registration form along with the appropriate fees to the address below.

STUDENTS, SPOUSES, OR RELATIVES: A special discount schedule has been approved to promote and encourage participation of undergraduates, pre-college students, non-science spouses or relatives. All students, non-science spouses, parents or relatives must register using a separate form. This registration does not include membership or meals.

**Each person must use a SEPARATE REGISTRATION FORM  
Please copy this form as needed.**

An Adobe PDF online fill-in form is available at  
<http://www.ohiosci.org/am-registration>

**PLEASE PRINT OR TYPE**

Check: \_\_\_\_\_ Ms. \_\_\_\_\_ Mrs. \_\_\_\_\_ Mr. \_\_\_\_\_ Dr.

Name \_\_\_\_\_  
First Middle Last

Job Title \_\_\_\_\_

School, Organization, Agency, Institution, or Employer  
\_\_\_\_\_

Is the following a home address? \_\_\_\_\_ Yes \_\_\_\_\_ No  
Students MUST use home, dorm or apartment address.

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_ Ohio County \_\_\_\_\_

Work Phone (\_\_\_\_\_) \_\_\_\_\_

Home Phone (\_\_\_\_\_) \_\_\_\_\_

FAX (\_\_\_\_\_) \_\_\_\_\_

EMAIL \_\_\_\_\_

**MAIL FORM WITH PAYMENT TO:**

The Ohio Academy of Science  
PO Box 12519  
Columbus OH 43212-0519  
FAX 614/488-7629

**Registration Fees**

Please check appropriate categories. One fee covers the entire meeting. Payment must be received by **March 28, 2014** to avoid higher rates. On-site registration will be accepted at the higher rate by credit card or check ONLY. ONLY first authors have pre-paid registration when they submitted their abstracts and DO NOT NEED to return this form. *First authors are already registered for the meeting.*

**CURRENT MEMBER REGISTRATION RATE**

		After March 28
_____ Professional	\$65	\$70
_____ Pre-college Teacher	\$50	\$55
_____ Retired	\$40	\$45
_____ Student	\$25	\$30

**NON-MEMBER PROFESSIONAL AND RETIRED REGISTRATION**

Includes membership

_____ Professional	\$140	\$145
_____ Pre-college Teacher (w/o Jour)	\$110	\$115
_____ Retired with Journal	\$80	\$85
_____ Retired (w/o Jour)	\$65	\$70
_____ College Student	\$65	\$70
_____ Pre-college student	\$65	\$70
_____ Pre-college student (w/o Jour)	\$50	\$70

Does not include Academy membership

_____ Pre-college Teacher	\$55	\$60
_____ Pre-college student	\$30	\$35
_____ College student	\$30	\$35
_____ 5-10 students each	\$15	\$20
_____ 11 or more students each	\$10	\$20

**NON-SCIENCE SPOUSE, PARENT OR A RELATIVE OF A FIRST AUTHOR**

_____ Spouse, parent or relative	\$20	\$20
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**CAREER SYMPOSIUM ONLY**

\$20	\$25
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**SATURDAY, APRIL 5, Box Lunch and drink**

_____ Lunch after All-Academy Lecture	\$10	\$N.A.
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Box lunch options: \_\_\_\_\_ Ham \_\_\_\_\_ Turkey \_\_\_\_\_ Beef \_\_\_\_\_ Veggie

**Please use a separate form for each MEMBERSHIP RENEWAL**

_____ Family	\$85
_____ Regular Member	\$75
_____ Retired Member w/OJS	\$40
_____ College Student	\$40
_____ Student (Age 17 & under) w/OJS	\$40
_____ Retired Member w/o OJS	\$25
_____ Student (Age 17 & under) w/o OJS	\$25
<b>TOTAL ENCLOSED</b>	\$ _____

**METHOD OF PAYMENT**

NO REFUNDS AFTER March 28, 2014. Returned checks subject to a \$30.00 fee. Only registrations paid by Purchase Order, VISA, or MasterCard will be accepted by FAX at 614/488-7629.

\_\_\_\_\_ This copy confirms a FAXed registration

\_\_\_\_\_ Check enclosed payable to The Ohio Academy of Science

\_\_\_\_\_ Purchase order enclosed No. \_\_\_\_\_

Online payment <http://www.ohiosci.org/am-registration>

Please charge my Credit card \_\_\_\_\_ VISA \_\_\_\_\_ MASTERCARD

Name on card \_\_\_\_\_

Billing address for card \_\_\_\_\_

Billing phone (\_\_\_\_\_) \_\_\_\_\_

CardNumber \_\_\_\_\_ Exp. Date \_\_\_\_\_ 3-digit

Security Code (last 3 digits on back of card) \_\_\_\_\_

Signature \_\_\_\_\_

## REGISTRATION POLICIES

123<sup>rd</sup> Annual Meeting

*The OHIO ACADEMY of SCIENCE*

Hosted by Walsh University, North Canton, Ohio

April 5, 2014

Advance registration must be received by March 28, 2014 to qualify for lower rates.

**ALL attendees must register.**

**An Adobe PDF online fill-in form is available at <http://www.ohiosci.org/am-registration>**

ALL MEETING ATTENDEES: Access to sessions by name tag only. Name tag, information and receipt will be available at the meeting. Please return the completed registration form along with the appropriate fees to the address printed below.

ONLY first authors have pre-paid registration when they submitted their abstracts and DO NOT NEED to return this form. First authors are already registered for the meeting. However, you do need to order a lunch if you wish.

STUDENTS, SPOUSES, PARENTS OR RELATIVES: To promote and encourage participation of undergraduates, pre-college students, non-science spouses, parents or relatives, a special discount schedule has been approved. All students, non-science spouses or relatives must register using a separate form. This registration does not include membership or lunches which must be paid separately. **\$20**

BOX LUNCHES AND DRINK: **These box lunches must be ordered by March 28 and will not be available to order the day of the meeting - \$10**

DISCOUNTED RATES FOR STUDENTS WHO ARE NOT FIRST AUTHOR: (Does not include membership.)

1-4 from same institution \$30 by March 28, 2014; \$35 thereafter.

5-10 from same institution \$20 by March 28, 2014; \$25 thereafter.

11 or more from same institution \$15 by March 28, 2014; \$20 thereafter

CAREER SYPOSIUM OR UNDERGRADUATE RESEARCH SESSION: The follow rates apply to promote and encourage participation in these two special events:

\$20 by March 28; \$25 thereafter

The All-Academy Lecture is open to the public without cost.

**Please use a SEPARATE REGISTRATION FORM for each person.**

Copy the form on the reverse side as needed.

MAIL FORM WITH PAYMENT TO:

The Ohio Academy of Science

PO Box 12519

Columbus OH 43212-0519

FAX 614.488.7629 for credit card or purchase order

Online payment option <http://www.ohiosci.org/am-registration>

**PREREGISTRATION DEADLINE: March 28, 2014.**



# The Ohio Academy of Science

*The OHIO ACADEMY of SCIENCE fosters curiosity, discovery and innovation to benefit society.*



### Please PRINT

Title: \_\_\_ Ms. \_\_\_ Mrs. \_\_\_ Mr. \_\_\_ Dr. \_\_\_ Prof.  
 Name \_\_\_\_\_  
 Employer, organization, school, institution or agency \_\_\_\_\_  
 Department, Street or PO Box \_\_\_\_\_  
 City/State/Zip \_\_\_\_\_  
 Is this a home address? \_\_\_ Yes \_\_\_ No  
 Home (\_\_\_\_\_) \_\_\_\_\_  
 Office (\_\_\_\_\_) \_\_\_\_\_  
 Email Address \_\_\_\_\_  
 Field of Interest \_\_\_\_\_

### Support or Membership Category

___ \$ _____ Tax deductible donation	___ \$75 Regular Professional Member with Journal
___ \$1,000 LIFE (installment plan available)	___ \$75 Science Teacher Member with Journal
___ \$1,000 Academy Sponsor	___ \$60 Science Teacher Member without Journal
___ \$750 Academy Sustainer	___ \$40 Retired (age 59 & over) Member with Journal
___ \$500 Academy Advocate	___ \$40 College Student (under age 30) with Journal
___ \$500 Corporate Member	___ \$40 Student (age 17 & under) with Journal
___ \$250 Academy Supporter	___ \$25 Retired Member without Journal
___ \$100 Institution, Organization or Agency Member	___ \$25 Student (age 17 & under) without Journal
___ \$100 Academic Department Member (institutional funds)	
___ \$100 School or School District (K-12) Member	
___ \$100 Friend of the Academy (personal funds)	
___ \$85 Family (maximum of 3 persons)	

### Method of Payment

Enclosed is a check for \$ \_\_\_\_\_ payable to The Ohio Academy of Science.  
 \$30.00 return check fee  
 Please charge my credit card \_\_\_\_\_.

You may also use the ONLINE PAYMENT OPTION:  
<http://ohiosci.org/become-a-member/>

Please PRINT name as it appears on card.

First  Middle  Last  
 \_\_\_ VISA \_\_\_ MASTERCARD

Card Number \_\_\_\_\_

Exp. Date |\_\_\_\_\_|/|\_\_\_\_\_|

Last 3 digits of signature panel |\_\_\_\_\_|

Full billing address \_\_\_\_\_

Billing address phone number (\_\_\_\_\_) \_\_\_\_\_

Email address of CARDHOLDER \_\_\_\_\_

Signature \_\_\_\_\_

**QUESTIONS?**  
 Phone 614.488.2228 • Fax 614.488.7629  
 Email [info@ohiosci.org](mailto:info@ohiosci.org) • <http://www.ohiosci.org>

Please Return to:  
The Ohio Academy of Science  
1500 W. Third Ave. Ste. 228  
Columbus OH 43212-2817



*See you next year!*

Capital  
University  
Ask. Think. Lead.



*April 4<sup>th</sup>, 2015 - Capital University,  
Columbus, Ohio*

***The OHIO ACADEMY of SCIENCE***

1500 West Third Avenue • Suite 228 • Columbus OH 43212-2817

Phone 614.488.2228 • Fax 614.488.7629

smcconoughey@ohiosci.org • <http://www.ohiosci.org>

*Fostering curiosity, discovery and innovation to benefit society.*



# The OHIO JOURNAL of SCIENCE

## Author's Instructions for Preparation of Manuscripts

The *Ohio Journal of Science* considers solicited **Book Reviews** and **Research Reviews**, and unsolicited **Brief Notes** and **Research Reports**. Solicited submissions will be requested by the editor. Research Reviews will be requested to serve as extensive surveys of the literature of an area of science, engineering or technology in which Academy members have an interest. Unlike Research Reports, the format of Research Reviews may be negotiated with the Editor but must contain a brief historical section and must extensively cite previous work.

Unsolicited submissions, in the form of presentations of quantitative or qualitative data (results) will be considered for peer review. Brief notes are manuscripts that are fewer than 3 printed pages (approximately 6 typed pages) and contain no more than one table, figure or other type of illustration. The editor will identify papers which meet these criteria as Brief Notes if not already categorized as such by the author. Research Reports are those papers which are longer than 3 pages or contain more than one illustration.

All manuscripts will be organized as follows:

Page 1— Title, Author(s), Running Head, Abstract

Page 2 and remainder—Introduction, Materials and Methods, Results, Discussion, Acknowledgments, Literature Cited, Tables, Figure Legends, Figures.

**STYLE.** The *CBE Manual for Authors, Editors, and Publishers*, 7th Ed. is used for editorial decisions with regard to style. Manuscripts should be typewritten using 1 inch margins on 8.5 x 11 inch paper. Article titles should be **sentence case** with only the first word and proper nouns capitalized. Text should be left-justified using twelve point type. Three copies should be submitted. Manuscript should be 1.5 spaced throughout, including the title and abstract. Arabic numerals should be used in preference to words when the number designates anything that can be counted or measured (7 samples, 43 species). One exception to this use is that numerals are not used to begin a sentence (Twenty-one species were found in . . .). The 2nd exception is when 2 numeric expressions are adjacent in a sentence. The number easiest to express in words should be spelled out and the other left in numeric form (The sections were divided into eight 4-acre plots.). Measurements and physical symbols or units shall follow the International System of Units (SI *Le Système international d'unités*) with metric units stated first, optionally followed by United States units in parentheses. *E.g.*: xx grams (xx ounces). Avoid personal pronouns throughout the manuscript and abstract.

**TITLE, AUTHOR(S), AFFILIATION(S).** The first page of the manuscript should contain the title, author(s) name(s), the affiliation of the author(s) at the time the research was carried out, a shortened title (running head), and the abstract. The title must be typed in upper and lower case letters as it will appear when typeset. Name(s) of the author(s) should be typed in capital letters below the title. The address (department, institution, city, state, postal code, country if not USA) should appear below the name of the author(s). If more than one institution is to be credited, they should appear in the order of the authors' affiliation. A running head of not more than 38 letters and spaces should be typed in capital letters between the address and the abstract.

**ABSTRACT.** In 250 or fewer words summarize any new methods or procedures critical to the results of the study, state the results and conclusions.

**INTRODUCTION.** The introduction should describe the knowledge that gave rise to the question examined by, or the hypothesis posed for the research.

**MATERIALS AND METHODS.** This section should describe the research design, the methods and materials used in the research (subjects, their selection, equipment, laboratory or field procedures), and how the findings were analyzed.

**RESULTS.** The text of the results should be a descriptive narrative of the main findings, of the reported study. This section should not list tabulated data in text form. Reference to tables and figures included in this section should be made parenthetically in the text.

**DISCUSSION.** This section should compare and contrast the data collected in the presented study with that previously reported in the literature. Unless there are specific reasons to combine the two, as explained by the author in the letter of transmittal, Results and Discussion should be two separate sections.

**ACKNOWLEDGMENTS.** Colleagues and/or sources of financial support to whom thanks are due for assistance rendered in completion of the research or preparation of the manuscript should be recognized in this section rather than in the body of the text.

**LITERATURE CITED.** References to scientific literature should be arranged alphabetically by first author's last name using the Name/Year (N-Y) method as described in the *CBE Manual*.

### Journals:

Author(s). Year. Article title. Journal title volume number (issue number):inclusive pages. [Italicize only scientific names, not names of journals.]

Thomison JB. 1988. Uniform requirements for manuscripts. *South Med J* 81(8):947-52. [Use last name + space + first and middle initial w/o space. Separate names of multiple authors with commas and do not use "and." For example, Smith JB, Jones PW, Granger GR. Year. Article title. Journal title volume number (issue number):inclusive pages.]

**Form of citation:** (Thomison 1988) [No comma between name and year.]

### Books:

Author(s). Year. Title. Place of publication: publisher name. Number of pages.

Voet D, Voet JG. 1990. *Biochemistry*. New York: J Wiley. 1223 p.

**Form of citation:** (Voet and Voet 1990)

**Multiple author citation:** (Steiner and others 1992) [Do not use *et. al.*]

**TABLES and FIGURES.** For review purposes, insert tables and figures into manuscript. **Additionally**, tables must be typed double spaced, one table to a page, numbered consecutively, and placed in the manuscript after Literature Cited. Since tables must be individually typeset, consolidation of data into the smallest number of tables is encouraged. A horizontal double underline should be made beneath the title of the table, and single underlines should be made the width of the table below the column headings and at the bottom of the table. Do not use vertical lines, and do not place horizontal lines in the interior of the table. Use footnotes, to clarify possible questions within the table, should be noted by asterisks, daggers, or other symbols to avoid confusion with numerical data. All illustrations are referred to as "Figures" and must be numbered consecutively. Tiff files are preferred. Figures may be photographs, computer generated drawings or graphs. Illustrations other than those generated by the author(s) must bear permission for use and credit to the originator. Each figure must have a complete legend. The legend should not be placed on the figure, but should be typed in order, double-spaced, on a separate sheet which precedes the figures in the manuscript. Figures should be referred to parenthetically in the text, for example (Fig. 1). The size and proportion of each illustration should be suitable for reduction to a single column. Excessive white space should be avoided. Illustrations will be reduced to one column width (3 and 3/8 inches) or two column width (7 inches) at the discretion of the editor. Lettering should be done of a size to ensure that it can be read after reduction. Incorporate a graphoc scale on maps and other illustrations where original size is a concern.

**FOOTNOTES.** Text footnotes **should not be used** with the following exceptions. A footnote to the title may be added editorially to state the dates of manuscript submission and revision. A footnote to name(s) of author(s) may be used to indicate present address different from that at which the research was done, or to indicate the author to whom inquiries should be directed. All other material or comments must be incorporated into the text. Literature Cited should not be inserted as foot-notes. Footnotes to tables are permissible, and are encouraged to promote clarity.

Attention to the above instructions will minimize the need for revision and editorial correction, and will shorten the time from submission to publication. Any questions which are not answered by these instructions, or by consulting the *CBE Manual for Authors, Editors, and Publishers*, 7th Edition, should be addressed to the editor.

### IMPORTANT:

After consulting the manuscript preparation guidelines above and at:  
<http://ohiojournalofscience.org/authors-instructions>.

Submit completed manuscripts online at:  
<http://ohiojournalofscience.org/manuscript-submission/>

Manuscript Processing  
*The Ohio Journal of Science*  
1500 W Third Ave Ste 228  
Columbus OH 43212-2817

For technical questions about electronic formats or other details for submission, contact:  
Phone: 614-488-2228 \* Fax: 614-488-7629 \* Email: OJS@ohiosci.org

# Ohio State's Island Campus on Lake Erie

# STONE LABORATORY

**Apply Now for summer 2014 courses.** For more information, including details about scholarships and jobs, visit [stonelab.osu.edu](http://stonelab.osu.edu) or call 614.292.8949.

## INTRODUCTORY COURSES

The courses listed to the right are one-week courses running Sunday–Saturday and are open to advanced high school and current college students.



### One-Week Courses – 2 credits

ENR 2360	Ecology and Conservation of Birds.....	June 15-June 21
EEOB 1930	Introduction to Biological Studies – Aquatic Biology.....	June 15-June 21
KNSFHP 1140.05	Lake Erie Sport Fishing.....	June 15-June 21
EARTHSC 1107	Field-Based Introduction to Oceanography.....	July 27-August 2
EEOB 1930	Introduction to Biological Studies – Aquatic Biology.....	July 27-August 2
ENTMLGY 1260	Introductory Insect Field Biology.....	July 27-August 2
EEOB 1930	Introduction to Biological Studies – Aquatic Biology.....	August 3-August 9
EEOB 1910	Introduction to Biological Studies – Local Plants.....	August 3-August 9

## UPPER-LEVEL COURSES

Open to college students who are studying biological sciences, education, and natural resources, as well as science teachers.



### Five-Week Courses – 4 credits

EEOB 5420	Aquatic Ecosystems – Ecology of Inland Waters.....	June 22-July 26
EEOB 3410	Ecology.....	June 22-July 26
EEOB 3310	Evolution.....	June 22-July 26
EEOB 5940	Field Zoology.....	June 22-July 26
EEOB 5930	Ichthyology.....	June 22-July 26

### One-Week Courses – 2 credits

EEOB 5910	Field Herpetology.....	June 15-June 21
EEOB 4950	Field Ecology.....	July 27-August 2
EEOB 5210	Spider Biology.....	August 3-August 9
ENR 5194	Group Studies: Climate and Sustainability.....	August 3-August 9

### Other Courses

EEOB 3189	Field Course: Environmental Science.....	June 10-July 4, 2 credits, 3 weeks on the Flagship <i>Brig Niagara</i>
ENR 5699	Current Topics in Environment and Engineering.....	June 22-July 26, 1 credit, 5 weeks
EEOB 5970	Larval Fish Identification Workshop.....	June 29, .5 credit, 1 day
EEOB 5950	Algae Identification Workshop.....	August 11-August 12, .5 credit, 2 days

## NON-CREDIT WORKSHOPS

Non-credit workshop courses last one to three days and are open to the public. Participants must be at least 18 years of age and have completed high school.

Larval Fish Identification Workshop.....	July 29
Algae Identification Workshop.....	August 11-August 12
Dealing with Cyanobacteria, Algal Toxins and Taste & Odor Compounds.....	August 13-August 14
Outdoor Photography Workshop.....	August 15-August 17
Lake Erie Sport Fishing Workshop.....	August 29-August 31
Fish-Sampling Techniques Workshop.....	October 11-October 12

## SCIENCE COURSES FOR EDUCATORS

Classes are open to classroom teachers, non-formal educators, and education majors with a rank of junior or above by the class date.

### One-Week Courses – 2 credits

EARTHSC 5189.05	Geologic Setting of Lake Erie.....	TBD
EARTHSC 5584	Principles of Oceanography for Educators.....	June 15-June 21
EEOB 4950	Field Ecology.....	July 27-August 2
ENR 5194	Group Studies: Climate and Sustainability.....	August 3-August 9
ENR 5614	Marine and Aquatic Education.....	August 3-August 9

## REU PROGRAM

Expand your research skills with Stone Lab's Research Experience for Undergraduates (REU) Scholarship Program. Students spend their non-class days working one-on-one with research supervisors, collecting data, analyzing discoveries, and preparing a final presentation.

- Reproductive biology of the round goby (Ichthyology)
- Distribution and ecology of crayfish (Ecology)
- Survival rates of birds of the Lake Erie Islands (Ornithology)
- Fisheries techniques: research and fish survey development (Fisheries Management)
- Lake Erie Watersnake field and laboratory research (Herpetology)
- Exploration of Lake Erie nutrient loading, hypoxic events (the "dead zone"), and harmful algal blooms (Limnology)

Course credits are based on the Ohio State University semester credit system and are transferable to most colleges and universities.

## TUITION ASSISTANCE AND JOBS

All students taking for-credit courses are eligible for scholarship funds, which typically range from \$100 to \$2,500. Students enrolled in five-week courses can also apply for Stone Lab's part-time positions or find jobs at local Put-in-Bay businesses. For more information, [visit stonelab.osu.edu/applynow](http://stonelab.osu.edu/applynow).

F.T. Stone Laboratory, The Ohio State University's Island Campus, is the Lake Erie research and teaching laboratory for the Ohio Sea Grant College Program. Course credits are based on the Ohio State University semester credit system and are transferable to most colleges and universities.

