

GLOBES Certificate in Environment and Society Certification Guidelines (Revision 2016)

Human activities are affecting Earth's life support systems and threaten services essential to society. The best solutions for today's interconnected environmental and human health challenges require bold, comprehensive, multi-disciplinary approaches. The GLOBES Certificate in Environment and Society provides an opportunity to acquire these skills and research experiences that complement and broaden a traditional PhD program of study. The Certificate is open to PhD, Law and graduate students in all disciplines with interests in environmental, global health, and sustainability research. Interdisciplinary seminars and training modules, and an interdisciplinary advisor prepare students to better understand the science underlying environmental problems, design appropriate technical solutions, and translate solutions effectively in society for the greater good.

GLOBES Certification is a three-part program:

Interdisciplinary Training (2 seminars and 2 training modules, total of 4 credits)

Upon admission, GLOBES students enroll in a 1-credit course each semester. The GLOBES Seminar takes place during Fall Semester and uses a current topic as a lens to examine how different fields work together to address contemporary, environmental issues. A Training Module (intensive, short course format) is held during Spring Semester and alternates *communication skill training* with *environmental policy* and other topics on a yearly basis. Students may enter the yearly rotation schedule at any time during their first through third years of study.

Integrative Research Component

Students develop an interdisciplinary research project as a component of the dissertation, extending the disciplinary themes along an applied policy, societal, or novel dimension not generally considered in the student's field of study. This project can take the form of a chapter of the dissertation or its equivalent (e.g., publication or other media product). The student develops a plan of study in consultation with the major professor and with the guidance of an external advisor whose expertise is outside of the primary discipline.

A project proposal is submitted to the GLOBES Executive Committee for approval and comment by the 4th year of study (for PhD programs). Oversight of the final project is in two parts: 1) a formal abstract is submitted to the GLOBES Executive Committee for review and 2) dual endorsement from the major advisor and external advisor certifying the interdisciplinary merits of the project and the work effort by the student.

Community of Scholars

Students are active contributors to the GLOBES community by participating in group projects, discussion groups, and formal and informal gatherings that make up the GLOBES interdisciplinary training experience. More senior students provide peer-to-peer mentoring of new students to welcome and advise new GLOBES participants.

This document is intended to help students plan a certificate program of study that best fits their research interests and master timetable for completion of degree. There is a wide degree of flexibility in developing a suitable program of study. Students are expected to identify their own course of study in consultation with their major advisor and interdisciplinary advisor.

Learning Goals for Certificate Students

- Develop communication skills and leadership capabilities with a strong ethics component in the area of environment and society.
- Acquire expertise in a secondary field of interest to extend and complement primary dissertation research.
- Engage with diverse publics, government agencies, private industry, and non-profits concerned with challenges to the environment.
- Build professional resumes and enhance career opportunities in and outside of academia with interdisciplinary research and educational experiences.

Definition of Interdisciplinary Research (IDR)

GLOBES employs the following definition found in the 2004 report “Facilitating Interdisciplinary Research” by the Committee on Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, Institute of Medicine. ISBN: 0-309-54727-X, 332 pages, 6 x 9, (2004).

“Interdisciplinary research (IDR) is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice.”

How to Apply

Interested students should complete the one-page application form (Appendix A, also found on the GLOBES website) that identifies primary research interests and applied interdisciplinary interests. The application should be signed by the student’s major advisor or DGS. Attach a current resume or CV and submit to the GLOBES Office, 434 Geddes Hall, or by email to Administrative Coordinator Ginna Anderson at g.anderso@nd.edu.

Applications are accepted on a rolling basis. We recommend that PhD students apply before the beginning of the third year of study. JD and other graduate students should apply before the beginning of the second year of study.

1. Certificate Guidelines: Coursework and Modules

- 1.1. In consultation with their major advisor and interdisciplinary advisor, students may select interdisciplinary coursework best suited for their interests. The sample course

listing (Appendix B) is a resource list and is meant to show a variety of courses that may apply.

- 1.2. The GLOBES Seminar on Interdisciplinary Research is a cohort-building forum where students gain an understanding of basic concepts from multiple disciplines. Student and faculty presentations explore different facets of a particular topic. Students may have the opportunity to present their own research to a non-specialist but academic audience, and receive topical and presentation feedback from outside their own field.
- 1.3. Short course training modules are designed to hone student communication, teaching, leadership, and presentation skills. The module format may also introduce a topic such as environmental policy, economics, scenario analysis or other topic in demand.

2. Certificate Guidelines: Interdisciplinary advisor

- 2.1. The interdisciplinary advisor should be added once the interdisciplinary component of the student's research has been firmly set. The role of an interdisciplinary advisor naturally evolves when tied to the interdisciplinary chapter and the corresponding need for additional expertise and mentoring.
- 2.2. Students should identify the interdisciplinary advisor(s) when submitting the interdisciplinary project proposal to the Executive Committee. The recommended timeframe is prior to the end of the third year of study for PhD students.
- 2.3. The interdisciplinary advisor need not be a T&R faculty member. For example, a student may identify an advisor with a specialty area of expertise who does not meet departmental criteria for thesis committee membership.
- 2.4. It is the responsibility of the interdisciplinary advisor to endorse the student's interdisciplinary research component and to notify GLOBES that the student has made satisfactory progress toward fulfilling this requirement. This endorsement takes the form of an endorsement letter that confirms the interdisciplinary merit of the project and the student's work effort.

3. Certificate Guidelines: Interdisciplinary Research Component

- 3.1. Students may choose to fulfill the interdisciplinary research requirement by 1) devoting a single thesis chapter to interdisciplinary research, 2) weaving an interdisciplinary approach throughout the dissertation, or 3) other publication or media project approved by the Executive Committee.
- 3.2. Students are required to submit a written proposal that describes their approach to the interdisciplinary research component and a plan for its execution to the GLOBES Executive Committee for approval and comment. This proposal should be submitted no later than the end of the third year of admission to the certificate program and updated each year during the annual Progress Meeting. (Use the proposal guidelines that follow in Appendix D).
- 3.3. Student contributions to group projects may serve to fulfill the interdisciplinary research requirement with the approval of the Executive Committee. The student should submit a

formal petition and a faculty advisor must endorse the student work effort by confirming that the student made significant contributions to the group research project.

- 3.4. Students may choose other forms besides the dissertation chapter to satisfy this requirement. A published paper, a presentation at an academic conference, or a presentation to a management/policy-making body are all feasible. Regardless, projects must clearly be seen as interdisciplinary by integrating knowledge, skills, or methodology from a field outside of the primary research focus.

4. Appeals to the Executive Committee

- 4.1. Students may make an appeal in the form of a written communication to the GLOBES Executive Committee. Examples of appeals are to grant exceptions to the guidelines e.g. make coursework/module substitutions.
- 4.2. The written appeal should state the guideline(s) that the student seeks to address followed by a justification statement that explains the reasons and circumstances that warrant granting the request. The appeal should clearly state the student's case and be sent in a timely manner that allows for sufficient review by the Executive Committee. Students should plan for a minimum of three weeks for committee deliberations.
- 4.3. Appeals should be addressed to the GLOBES Director and sent to the GLOBES Administrative Coordinator (g.anderso@nd.edu) for distribution and follow-up.
- 4.4. The GLOBES Director may approve student appeals at his/her discretion if the appeal does not require a review by the full committee due to similar precedent.

5. Certificate Program of Study Timeline

Students should be proactive in planning a course of study that complements their home department requirements. The GLOBES timetable is flexible so that there is little or no impact on time to degree. Courses and modules taken prior to admission to the Certificate program may count toward Certificate requirements with the approval of the program director. Coursework may also double count toward home departmental requirements at the discretion of the Director of Graduate Studies.

The annual Progress Meeting provides an opportunity for certificate students to meet individually with members of the GLOBES Executive Committee to monitor progress, make recommendations regarding the interdisciplinary research component, and discuss program strengths and weaknesses.

Recommended PhD course of study:

Year One:

Seminar 1/Module 1 (additional coursework optional)

Year Two:

Seminar 2/Module 2 (additional coursework optional)

Year Three:

Identify interdisciplinary advisor and write proposal for interdisciplinary research component for review by Exec Committee (may include request for mini-grant award funds)

Begin work on interdisciplinary research

Years Four and Five:

Complete interdisciplinary research component, publish or present results. GLOBES Certificate is presented 1) upon successful defense of dissertation thesis, or other formal graduate degree, and 2) receipt of letter of endorsement by the interdisciplinary advisor.

6. Community of Scholars

GLOBES students are expected to contribute to the shared experience by being actively involved in the community of scholars. A GLOBES Calendar of Events is distributed at the beginning of each semester of study. Events placed on the calendar connect to GLOBES themes of science policy and communication, cross-cutting talks on environment and sustainability topics, and networking opportunities for faculty and students in environmental research. Certificate students are expected to attend these events as part of their GLOBES experience.

7. Resources

Certificate students in good standing may apply for mini-grant award funding. These requests fund up to \$1,500 in support of interdisciplinary research. The purpose of the mini-grant award is to support novel and enhanced research on environmental and human health topics as a result of an exchange of ideas and practices across cultural and/or disciplinary boundaries. Conference travel expenses are discouraged. The review committee will look favorably on proposals that include a real world practicum component. (See App D for Interdisciplinary Research Proposal Guidelines.)

Please see the GLOBES website for additional information at <http://reilly.nd.edu/globes>. Students can also find links to [external fellowship opportunities](#) that emphasize science research in the context of policy and public engagement.

An excellent resource for interdisciplinary faculty advisors is the Sustainability Faculty Network found [here](#). Past faculty and research labs that have hosted GLOBES students can be found [here](#).

Appendix A: GLOBES Certificate Application
An Interdisciplinary Graduate Training Program in Environment and Society

Your application to the GLOBES Certificate in Environment and Society is welcome!
Please complete the form below and return with your CV or resume to: g.anderso@nd.edu.
Applications are accepted on a rolling basis. A review by the Executive Committee will take place and letter of decision sent within 3 weeks.

Student Name: _____

Email Address: _____ Campus Mail: _____

Primary Research Interests:

Interdisciplinary Interests (*Please describe your cross-disciplinary interests as well as social, policy, or management applications of your research*):

University of Notre Dame Home Department: _____

Year of Admission/Degree Program (PhD, MS, MFA, Law, etc): _____

Major Advisor (or DGS): _____

The mission of GLOBES is to challenge students to think at the interface of the environment and society by exploring pressing environmental issues and the societal implications of those issues. GLOBES integrates ecology, environmental science, engineering, law, policy, and the humanities to inspire interdisciplinary scholarship and engage multiple perspectives.

Please note that your PhD or other degree is earned through your home department and that the GLOBES program certificate is contingent upon your ability to obtain a formal graduate degree.

Student Signature Date

Major Advisor (or DGS) Signature Date

Return with your CV or resume to: Ginna Anderson, GLOBES Program, 434 Geddes Hall,
University of Notre Dame, Notre Dame IN 46556
Ph 574.631.3287 Email: g.anderso@nd.edu Website: reilly.nd.edu/globes

Appendix B GLOBES Certificate Sample Course Listing

This list of coursework is not comprehensive, students may suggest courses that are not on this list as long as they fit the intent of GLOBES.

GLOBES Core Courses

Strongly Recommended (team taught, not offered every year):

BIOS 60524 Global Change and Civilization (new title 2014, formerly Humans and the Global Environment, J. Hellmann/M. Schurr)

BIOS 60522 Humans, Genes & Environment (H. Hollocher/A Fuentes)

CE 60355 Water, Disease, & Global Health (D. Severson/J.Shrout)

GLOBES Seminars

Required 1-credit Seminar:

BIOS 60581-02 GLOBES Seminar on Interdisciplinary Research

May be substituted for above GLOBES seminar with approval of director:

BIOS 60601-01 Global Health Colloquium

CE 63400-01 Environmental Fluid Dynamics Seminar

BIOS 60202 Global Bioethics Seminar

GLOBES Electives

Please Note: 1) *Non-major students should contact the course instructor for permission to enroll in elective coursework. Pre-requisites may be required, e.g., preparation in advanced mathematics for engineering courses.*

2) *With the approval of the Program Director, students may earn up to 3 credits toward coursework requirements through independent study under a faculty advisor outside of the primary field of study*

Biological Sciences

BIOS 50544 Environmental Justice

BIOS 50545 Biomedical Ethics

BIOS 60310 Biogeochemistry and Ecosystem Ecology

BIOS 60320 Aquatic Conservation: Global Freshwaters, Science, and Policy

BIOS 60412 Introduction to Systems Biology

BIOS 60507 Genomics and Bioinformatics

BIOS 60508 Population Genetics

BIOS 60525 Community Ecology

BIOS 60527 Stream Ecology

BIOS 60529 Population & Disease Ecology

BIOS 60530 Immunobiology of Infectious Disease

BIOS 60552 Topics in Ecology

Policy of Biological Invasions Seminar/Conservation Strategies for Global Climate Change/Ecological Forecasting

BIOS 60563 Modern Infectious Disease Epidemiology

BIOS 60569 Epidemiology and Ecology of Infectious Diseases
BIOS 60574 Topics in Evolutionary & Systematic Biology
Ecological Genetics and Genomics
GH 60545 BioEthics

Engineering

CE 60330 Environmental Biotechnology
CBE 60572 Modeling - Ecology and Environment
CSE 60497 Data Mining
CSE 60884 Complex Networks
CSE 60732 C/C++ Programming
ENVG 60810 Geographic Information Systems (GIS) Course (4 credit lecture and lab)

Other Departments

ANTH 65588 Archaeology Field School
BAUG 30505 Social Entrepreneurship/Microventuring I (Gigot Center)
ECOE 70311 Environmental Economics
HIST 93984 Darwinian Revolution
HPS 93632 Environmental History
HPS 93825 Philosophy of Science and Public Policy
HPS 93211 History and Philosophy of Health and Environment
LAW 70348 Biodiversity and the Law
LAW 70349 Environmental Law
LAW 73328 Climate Change Law
MGT 76030 Business on the Frontlines (approved as a 4-credit course plus 1-credit module)
PSY 60108 Bayesian Statistics
SC 40500 Scientific Entrepreneurship
SOC 63591 International and Global Sociology
THEO 60635 Environmental Ethics (crosslisted with HPS)

GLOBES Modules (short course, variable credit training modules)

BIOS 60521 GLOBES Module topics will change each academic year. Possible topics follow:

- Communications Training: Media Focus
- Communications Training: Policy Focus
- Communications/Leadership Training: Washington DC
- Scientific Integrity
- Team Teaching Practicum
- Economics of the Environment
- Practicum in Environmental Ecology (UNDERC)

Approved courses that can count toward a module credit with approval of program director:

- Kaneb Center Teaching Certificate
- Science Policy Ethics Course (DC Trip Immersion) College of Science & Center for Social Concerns (SC33902)
- Monitoring Technology at ND LEEF (proposed, new)

Appendix C: GLOBES Interdisciplinary Research Component Interdisciplinary Advisor Role and Responsibilities

The purpose of the GLOBES interdisciplinary research component is to advance novel research on environmental, human health, and sustainability topics as a result of an exchange of ideas and practices across cultural and/or disciplinary boundaries. Examples of interdisciplinary projects are: 1) investigate policy, legal, ethics, or cultural barriers to the application of scientific and technical research, 2) acquire training and employ new research methodologies from a discipline outside of the student's primary field of study, 3) organize or assume a leadership role in an outreach project that engages the public and furthers understanding of environmental and sustainability issues. Depending on home departmental requirements, the final research product may take various forms:

1. A chapter of the dissertation thesis
2. Methodology and content from a second discipline is woven throughout the dissertation thesis
3. Significant authorship of a published manuscript with an interdisciplinary focus
4. Formal presentation at an academic conference outside the student's primary discipline
5. Formal presentation to a policy or management group relevant to the primary research

Role of the Interdisciplinary Advisor

GLOBES requires that students identify at least one faculty member or professional expert from outside the primary field of interest to recommend course selection and to mentor students in acquiring a secondary knowledge area and skill set. Our experience from the IGERT training grant has shown that the role of an interdisciplinary advisor naturally evolves when tied to the required interdisciplinary project and the corresponding need for additional expertise and mentoring. The GLOBES Advisor must represent a discipline other than that of the student's primary (home) department. Participation in the GLOBES program as an advisor means that the faculty member understands and supports the interdisciplinary emphasis of the program, is willing to guide the student in developing sufficient interdisciplinary expertise, and helps to evaluate the student's progress. The advisor need not be a voting member of the student's thesis committee. In many cases, the interdisciplinary advisor may be a collaborator of the student's major faculty advisor, reaffirming the cross-disciplinary, collaborative relationship. At the time of the dissertation defense, the interdisciplinary advisor provides a letter of endorsement, describing the interdisciplinary merits and work effort of the student (especially in the case of group or multi-authored research).

Letter of Endorsement* on behalf of GLOBES Certificate student should address (1) below, plus one or more of the other items as they pertain to the student's interdisciplinary research project:

1. Description of relationship with the student and summary of mentoring activities.
2. Evidence of innovative individual research in an interdisciplinary context.
3. Evidence of engagement in building cross-disciplinary collaborations
4. Evidence of attracting support for cross-disciplinary activities
5. Evidence of outreach through application (communications, technology transfer, and community building)
6. Evidence of positive environmental and/or social impacts.

*This letter is required, but may be relatively brief.

Appendix D Interdisciplinary Research Proposal Guidelines & Format

Examples of interdisciplinary projects are to: 1) investigate policy, legal, ethics, or cultural barriers to the implementation of solutions to environmental or human health problems, 2) acquire training/engage new research methodologies in a discipline outside of the student's primary field of study, 3) organize or assume a leadership role in an outreach project that advances public understanding of environmental/sustainability issues.

1. The cover page of the proposal should include: last name, first name, department, email address, academic advisor, email of academic advisor, project title, and total \$ amount requested. Please include name and project title on additional pages of the proposal.
2. Two-page project description that includes a project summary, the scope of work to be performed, timetable, connections to the student's primary thesis/project, and possible outcomes.
3. Proposals that include a request for funding should provide a one-page detailed budget and justification statement that also includes any non-GLOBES sources of income.
4. In the case of a team project, identify the team leader and list project participants and a brief research statement from each.
5. An endorsement letter by the major faculty advisor that supports the project and its connection to the student's primary research.
6. The interdisciplinary advisor should also provide a statement of support for the project.
7. Submit all materials in a single PDF document to the GLOBES Admin. Coordinator: g.anderso@nd.edu

Proposals will be reviewed by the GLOBES Executive Committee on a rolling basis. Please allow a minimum of 3 weeks for review and response.

Project Final Report: Awardees must prepare a 2-page written summary report of their results and may be asked to provide an oral presentation on the project.