Applied Biodiversity Science (ABS)

Bridging Ecology, Culture and Governance for Effective Conservation

National Science Foundation (NSF)
Integrated Graduate Education, Research and Training (IGERT)
Program at Texas A&M University

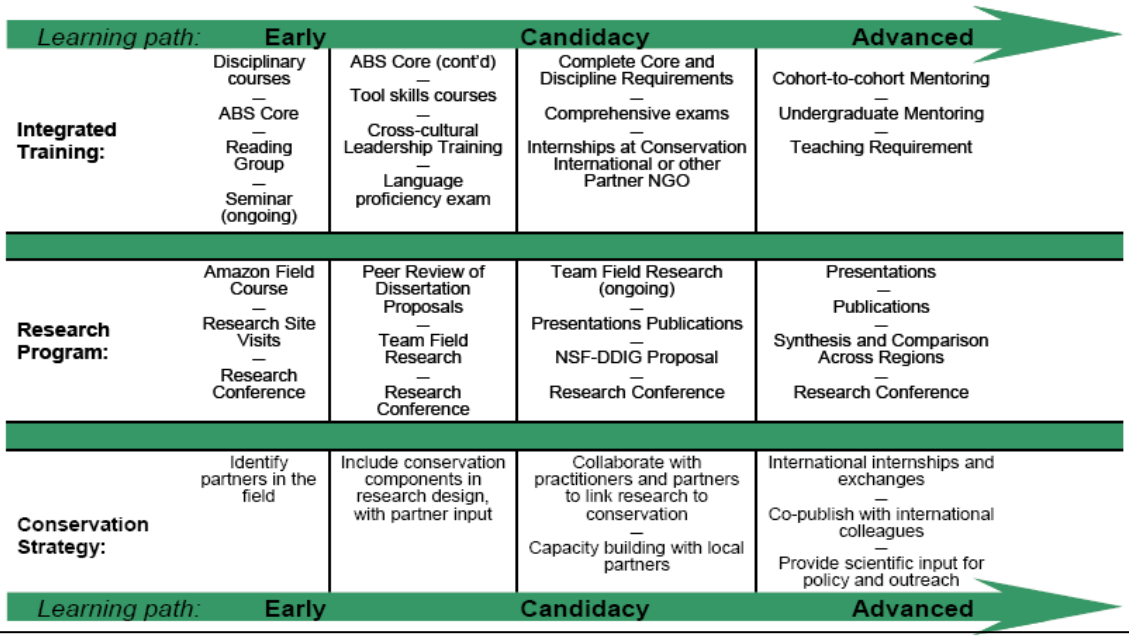
Certification Guidelines for ABS Student Trainees and Associates

The purpose of this document is to establish the process by which ABS Trainees (NSF-IGERT fellowship recipients) and Associates (other graduate students participating in the ABS Program) will develop and complete the learning path leading to a certificate in Applied Biodiversity Science (Fig. 1). We have listed below the required planning and reporting steps (Fig. 2), the competencies students must develop (Table 1), courses approved as suggested mechanisms to document competency (Tables 2-7), and examples of formats for the Learning Plan and petitions (Tables 8-9). These guidelines are designed to meet the overarching vision of the program, which is to "produce scientists prepared to understand ecological functions of local ecosystems, and also the activities and needs of surrounding communities in wider social, economic, and political contexts." (http://biodiversity.tamu.edu/vision.html)

Objectives

1. Optimize flexibility within the certification process, to meet individual learning goals
2. Increase opportunities for cross-disciplinary and interdisciplinary experience
3. Build an intellectual community to facilitate collaboration among faculty and students

Fig. 1. Diagram of the general Learning Path that each student will individualize by preparing a specific ABS Learning Plan (source: http://biodiversity.tamu.edu/program_elements.html)



ABS Learning Plans for Students

Over the course of his/her graduate career, each ABS NSF-IGERT Trainee or Associate should achieve competency in 10 core areas (Table 1). We recognize that each student will enter with a distinct set of competencies already established; the Learning Plan procedure will focus effort on those competencies that each individual needs to strengthen, to meet the overall goal of the program. The procedure will be introduced during the ABS Student Orientation at the beginning of each fall semester.

The timeline for completion of the ABS Learning Plan is diagrammed in Figure 2. During the first semester after acceptance into the program, the Learning Plan will be developed by the student, his/her major advisor, and an assigned member of the ABS Certification Committee (ABS-CC). This member of the ABS-CC will be referred to below as the student's "CC Advocate". Following approval of the Plan, students must petition the ABS-CC for modification of the Plan. The process for developing the student Learning Plans will be as follows:

1) By the end of the first semester, the student must meet with her/his primary advisor and the CC Advocate to prepare and sign the first draft of the Learning Plan. Any questions should be directed to the ABS-CC for clarification prior to submission of the final draft.

2) By the beginning of the first spring semester, the student must submit the ABS Learning Plan to the ABS-CC for approval. The Learning Plan on record for each student will be used to (a) coordinate interdisciplinary research teams, (b) document changes due to subsequent petitions, and (c) prepare annual reports to the granting agency (NSF-IGERT).

3) Students will report on their progress each subsequent year, by the Monday after Spring Break. Coincidentally, each student may petition to modify the ABS Learning Plan, as needed to update the committee on any modifications they would like to enact. Petitions will be reviewed for approval by the ABS-CC. Toward the end of each spring semester, students will also be required to formally report through the Fastlane website on their progress and accomplishments to the ABS funder, the National Science Foundation.

During each student's last semester he/she must again meet with the primary advisor and the CC Advocate to document how each competency was achieved. Based on the student's Final Report, the ABS-CC will make a recommendation to the Executive Committee on whether or not the student will receive the ABS Certificate. Students may appeal by requesting an informal meeting with the Chair of the ABS Certification Committee (see http://wfsc.tamu.edu/jpackard/PS.pdf for suggested guidelines on positive problem solving).

Competencies

To document progress toward achieving the 10 core competencies (Table 1), each student's ABS Learning Plan will be submitted and revised as indicated below (Fig. 2). To optimize flexibility, students may substitute a specific mechanism of equal or better quality than recommended in Table 1. The justification for substitutions must be explained in each student's ABS Learning Plan, in terms of individualizing the general path (Fig. 1). Students are encouraged to communicate with their CC Advocate should need for positive problem-solving arise.

Fig. 2. Timeline for documentation of competencies achieved via the ABS Learning Plan.

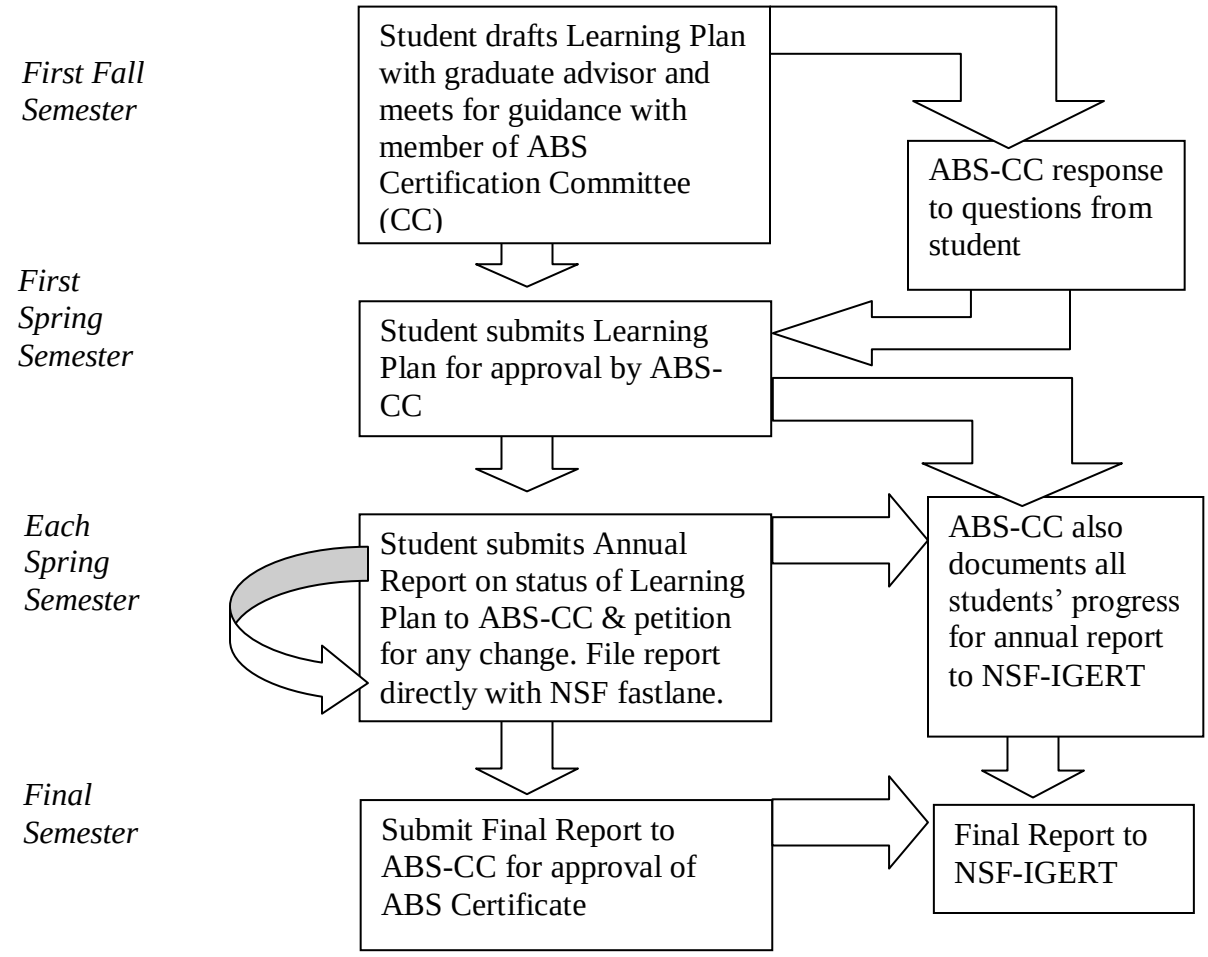


Table 1. List of required core competencies and approved mechanisms to document achievement of each competency, as required for certification in Applied Biodiversity Sciences.

Required Core Competency	Suggested Mechanisms
1. Human-Environment Interactions & Research Ethics	The two ABS core courses (Table 2) AND Regular attendance at ABS Seminar Series
2. Interdisciplinary Breadth	At least one social science graduate course for natural scientists (Table 3) OR At least one natural science graduate course for social scientists (Table 3)
3. Regional Studies	1. One course with specific focus on the region in which the student plans to conduct research that covers history, culture, ecology, and geography (Table 4). OR 2. The ABS Amazon Field Course (required for NSF-IGERT Trainees). OR 3. Previous significant time spent in region.
4. Multidisciplinary Collaboration	Collaborate with another student on complementary dissertation project (includes visits to each other's field sites, collation of data, peer review of proposals and dissertations, and/or co-author publications or presentations) AND One member of dissertation committee should be from a discipline other than the student's primary discipline. Discipline here is defined as a particular theoretical and methodological approach (may or may not be synonymous with department).
5. Research Design	One graduate course on research design (Table 5)
6. Disciplinary Depth	Course list to be decided upon between student, primary advisor and department's graduate advisor
7. Cross-Cultural Skills	Training in cross cultural communication skills (Table 6)
8. Language Skills	Can either be acquired through course work or time spent in field. Must pass ACTFL Language Exam or equivalent in language common to region where dissertation to be completed to required level of Intermediate High by end of doctoral study *(http://www.actfl.org)*
9. Communication Skills (Research Presentation)	Presentation at Ecological Integration Symposium or other national-level conference. AND Lead a session of the ABS journal club
10. Applied Research	Complete internship and/or conduct research in conjunction with host country academic institution or civic organization. AND Disseminate research results in format accessible to those who might apply them (pamphlet, policy piece, report, presentation, web-based pubs, workshops, etc.).

Courses Related to Each of the Competencies

Courses listed in the following tables have been approved by the ABS-CC as mechanisms to help document achievement in each of the 10 competencies. To add to this list of approved courses, students may petition the ABS-CC. The Learning Plan and petition process may also be used to substitute courses from other institutions and/or equivalent professional experience.

Table 2. Competency 1 - Human/Environment Interactions & Research Ethics

Course No.	Course Title	ABS Faculty	Semester
WFSC 689	Applied Biodiversity Science I	Stronza, Fitzgerald	fall
GEOG 689	Applied Biodiversity Science II	Jepson, Heyman	spring

Table 3. Competency 2 – Interdisciplinary Breadth

Course No.	Course Title	ABS Faculty	Semester
Ecological Functions and Biodiversity: Natural Science courses for Social Scientists			
BIOL 689	Behavior, Genes and Evolution	Rosenthal, Carney	
ENTO 601	Principles of Systematic Entomology	Woolley	fall
ENTO 606 GENE 606 WFSC 646	Quantitative Phylogenetics	Woolley, Mateos	spring
WFSC 602	Field Herpetology	Fitzgerald	spring
WFSC 606	Systematic Herpetology	Fitzgerald	spring
WFSC 613	Animal Ecology	Gelwick	spring
WFSC 620	Behavioral Ecology	DeWitt Packard	fall SSI
WFSC 624	Population Dynamics	Winemiller	spring
WFSC 631	Ethology	Packard	fall
Communities and Governance: Social Science Courses for Natural Scientists			
AGEC 673	Resource and Environment Economics	Woodward	fall
ANTH 609	Culture and Evolution	Alvard	fall
ANTH630	Human Evolutionary Ecology	Alvard	fall
ESSM 671	Ecological Economics	Kreuter	fall
GEOG 619	Human Impacts on the Environment	Brannstrom	spring or fall
GEOG 6XX	Cultural and Political Ecology	Jepson/Brannstrom/O'Reilly	fall
GEOG 621	Land-Use and Land-Cover Change	Jepson	fall
RPTS 689	SPTP Ecotourism	Stronza	spring
RPTS 900	Development & Management of Protected Areas	Stronza	fall

Table 4. Competency 3 - Regional Studies

Course No.	Course Title	ABS Faculty	Semester
GEOG 622	Environment & Society on the US Mexico Border	Jepson	Spring or Fall
GEOG 323 /685	Latin America	Brannstrom	Every semester
TBA	ABS Amazon Field Course	Stronza et al.	winter

Table 5. Competency 4 - Research Design

Course No.	Course Title	Faculty	Semester
AGEC 607	Research Methodology	Bessler	spring
EDAD690-604	EDAD Research Proposal Preparation	Lincoln	spring
GEOG 611	Geography Research Design	Houser	spring
RPTS 615	Analytical Techniques in Recreation & Parks	Petrick/Stronza	Spring 2009/10
WFSC 609	Wildlife Research Methods	Peterson	fall

Table 6. Competency 7 - Cross-Cultural Skills

Course No.	Course Title	Faculty	Semester
WFSC 681	Seminar in Cross Cultural Communication: Communities & Conservation	Packard	fall, spring
~~AGEC~~ TBA	Cross Cultural Skills Training OPTION NOT AVAILABLE 9/13/2010	McCormick & Piña	In development

Table 7. Competency 10 - Applied Research

Course No.	Course Title	Faculty	Semester
RENR 650	Leadership/Management for Environmental NGO's	Loh	fall
WFSC 607	Environmental Conflict Management	Peterson	fall

Table 8. Example format for ABS Learning Plan

For Internal Use by ABS-CC

APPROVAL	*Fill in the names (print), with room for signatures & date when approved (below)*
Student:	
OGS Chair:	
CC Advocate:	
CC Chair:	
CC Comments:	
Write the dates this Learning Plan was modified by petition and attach each petition upon approval:	

Please fill out the following form before meeting with your ABS-CC Advocate.

1. Human-Environment Interactions & Ethics	
Semester/YR	ABSI core course (Table 2) AND ABSII core course AND Regular attendance (>60%) at ABS Seminar Series (sign in sheet)
Explain how this fits into the general ABS Learning Path and any variation from Table 2:	
2. Interdisciplinary Breadth	
Course no.	At least one social science graduate course for natural scientists (Table 3) OR At least one natural science graduate course for social scientists (Table 3)
Explain how this will aid you in achieving this competency and any variation from Table 3:	
3. Regional Studies	
Check one	1. One course on region in which the student plans to conduct research (Table 4).OR 2. The ABS Amazon Field Course (required for NSF-IGERT Trainees).OR 3. Previous significant time spent in region.
Explain how this will aid you in achieving this competency and your thinking on #1 or #3:	
4. Multidisciplinary Collaboration	
Check off	1. Collaborate with another student on complementary dissertation project AND 2. One member of dissertation committee from a discipline other than the student's primary discipline.
Explain how you plan to document this competency and your thinking on #1 and #2:	

5 . Research Design	
Course no.	1. One graduate course on research design (Table 5) OR 2. Substitute course (e.g. from another institution)
Explain your thinking on choosing the course or substitute course.	
6. Disciplinary Depth	
Date approved	Courses listed on OGS degree plan
Explain the field which you consider to be your area of disciplinary depth:	
7. Cross-cultural Skills	
Course/YR	Training in cross cultural communication skills (Table 6) Other:
Explain your thinking on choosing the course or equivalent substitute.	
8. Language Skills	
Course/YR	1. Course work OR 2. Must pass ACTFL Language Exam or equivalent
Explain your thinking on choosing the course or equivalent substitute.	
9. Communication Skills (Research Presentation)	
Date	1. Presentation at Ecological Integration Symposium / ABS Conference OR 2. National-level conference. AND 3. Lead a session of the ABS journal club
Explain how your choice fits into your overall ABS Learning Path:	
10. Applied Research	
Check off	1. Complete internship AND/OR 2. Conduct research in conjunction with host country institution/organization AND 3. Disseminate research results in format accessible for those who might apply them
Explain in more detail your plans to meet this competency:	

Table 9. Example format for petition to be submitted for student requests to update or modify an approved ABS Learning Plan. This is due by the first Monday after Spring Break. It should be submitted through the student's ABS-CC Advocate to the ABS-CC Chair.

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APPROVAL	*Fill in the names (print), with room for signatures & date when approved (below)*
Student:	John Doe
OGS Chair:	Dr. Urs Kreuter
CC Advocate:	Dr. Rich Woodward
CC Chair:	Dr. Jane Packard
CC Comments: The committee has discussed this and agrees with preferred option.	

Please fill out the following form before meeting with your ABS-CC Advocate.

PROBLEM STATEMENT	*What is your perception of how to define the problem? It is easier for us to understand your perspective when you tell us how you frame the problem.*
I chose WFSC 609 to document the Research Design competency #5. After meeting with the professor, I believe it is not relevant to my discipline. I have had multiple statistics courses at another university as part of my masters program and have successfully published a paper from my master's thesis. I believe I have a good understanding of research design.	
GOOD ASPECTS	*What aspects of the situation are not problems? It is easier to find a positive solution when we understand what is working (no change needed).*
I understand the need for documenting competency in research design, as a basis of knowledge and understanding that is distinct from statistics. The statistics is more the technique of how to apply the design. For students who have not completed a master's degree, I think it would be good to take a design course.	
OPTIONS TO CONSIDER	*What options might be considered to address the problem? One person's solution is another person's problem, so please include several options.*
A. Take WFSC 609, to add breadth to my degree plan B. Substitute WFSC 618 Study Design for WFSC 609 C. Submit a reprint of my published paper for documentation of this competency D. Substitute a statistics course for WFSC 609	
PREFERRED OPTION	*Which option do you favor, and why? Please explain this in terms of your own learning goals as well as the goals of the overall program.*
B. Dr. Morrison teaches WFSC 618, which is more relevant to my interests in mitigation and restoration, in contrast to WFSC 609 (see attached syllabi)	