

# Evolutionary Studies' Reproductive Successes and Failures: Knowing the Institutional Ecology

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## ABSTRACT

The Evolutionary Studies (EvoS) Consortium has a number of resources available to help new EvoS programs get established, but there is not yet a clear formula that guarantees the success or failure of an effort. From the inside, it seems clear that any institution dedicated to liberal arts and science education should embrace a program that exposes students to the one theory with the power to explain all life and transform how students view the world. However, evolution education is no more the pinnacle of a Socratic “Great Chain of *Learning*” than humans are one of “*Being*.” To illustrate this, we discuss two initiatives where success may have seemed like a foregone conclusion because of previous successes in establishing EvoS programs at schools in the same state system but where, despite this, those efforts stumbled. On the other hand, a program initiated in the Deep South, thought inimical to evolution education, has taken off quickly. Comparing these endeavors highlights the variables in play within given institutions that must be accommodated. Those include the importance of tenured or tenure-track leadership, positively disposed administrators in departments and colleges, manageable teaching loads, as well as idiosyncratic institutional concerns. We consider how to overcome barriers for programs that are not initially successful and to ensure sustainability for those that are. The EvoS Program, writ large, must be general enough in body to adapt to an array of environmental conditions but specialized in focus to uniquely adapt and thrive.

## KEYWORDS

Evolutionary Studies, Institutional Ecology, Interdisciplinarity, Administrative Support, Program Leadership

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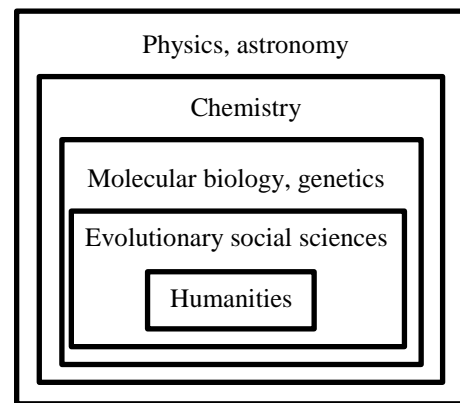
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## INTRODUCTION

The success of several Evolutionary Studies (EvoS) programs over the past decade has been well documented (see [www.evostudies.org](http://www.evostudies.org)). These programs incorporate psychology, biology, anthropology, the arts (theater, costuming, and fine arts), communication studies, and other seemingly unconnected disciplines. These disciplines are not simply a smorgasbord of fields that employ evolutionary principles but are obviously interdependent and nested within each other when viewed in an evolutionary frame (Carroll, 2011). For instance, as illustrated in Figure 1, evolutionary applications to the humanities rely on evolutionary interpretations of human social behavior as developed in anthropology, psychology, sociology, and other social sciences. These in turn draw on research in evolutionary biology and genetics, which are based on principles of biochemistry and physics. Even with this natural complementarity of the disciplines involved in an EvoS program and the success of such programs throughout the Northeastern United States and down the Eastern Seaboard, there are various pitfalls and obstacles in developing them. The following case studies outline efforts to overcome these issues—even those that end in failure—and to increase the probability of successfully establishing future EvoS programs. One describes a successful effort at setting up a program in the Deep South, while two of the cases involve unsuccessful attempts at State University of New York (SUNY) schools. In fact, while every process is different, even in statewide agencies like SUNY, there are common difficulties, which can be summarized as chiefly relating to funding, leadership and staffing, interdisciplinary cooperation, and university approval.

Examination of the following cases suggests that a formula for overcoming these challenges and starting an EvoS minor includes several factors. First, faculty across an institution with the requisite expertise and interest to offer courses that bind the program together are essential, as is a “spark plug” willing to commit to pushing the effort through, a tenured or tenure-track faculty member to direct the program, and supportive administrators. These are self-evident factors in retrospect, but they are difficult to recognize from the outset and vary from campus to campus. The importance of sharing these narratives is to provide examples that might guide future spark plugs in navigating potential obstacles to starting their own programs and enhancing the EvoS initiative worldwide.



**Figure 1.** The evolutionary disciplines are nested in causal constraint. Evolutionary interpretations and applications in the humanities are derived from the evolutionary social sciences. Those principles are based on work in molecular biology and genetics, which rely on knowledge of biochemistry, and chemistry is beholden to laws of physics and principles of astronomy (Redrawn from Carroll 2010, [www.umsl.edu/~carrolljc/](http://www.umsl.edu/~carrolljc/)).

**Table 1.** EvoS program status at University at Albany (SUNY), SUNY Oswego, and University of Alabama.

	<b>Institution</b>		
	University at Albany	SUNY Oswego	University of Alabama
<b>Type of institution</b>	State research institution; graduate, undergraduate and professional programs	Four-year teaching college; some Master's level programs	State research institution; graduate, undergraduate and professional programs
<b>Number of students</b>	~17,000	~6,500	~33,000
<b>Students interested or involved in program</b>	~20		~23 enrolled 4 graduated 4 dropped ~24 in Club*
<b>Number of faculty</b>	>1,000	~400	1,731
<b>Faculty involved in EvoS program</b>	9 (steering committee) ~18 (expressed interest)	7	~30
<b>Departments involved in EvoS program</b>	6	6	7
<b>Existing interdisciplinary programs</b>	2	9	5**

\*Reflects only additional EvoS Club members not enrolled in minor

\*\*Includes EvoS program

These narratives regard initiatives at the University at Albany (UAlbany), SUNY Oswego, and the University of Alabama. Table 1 summarizes some of the key similarities and differences in these institutions regarding factors necessary for the establishment of an EvoS program. The UAlbany is a large state university with a number of interdisciplinary programs and faculty familiar with and supportive of EvoS. The effort there stumbled initially, which we discuss as follows, while highlighting the necessary factors for this program to take hold. SUNY Oswego is a small state school that suffered in its initial effort due to factionalism among the involved departments. However, as the environment there has changed, there is renewed hope for the successful institution of an EvoS program. The University of Alabama is the flagship research institution for the state of Alabama. Despite a statewide paucity of support for evolution education, the program at Alabama was immediately successful due to preexisting factors, but long-term sustainability is less certain.

### UNIVERSITY AT ALBANY (UAlbany)

The University at Albany (UAlbany) is a large research institution in the state capitol of New York with about 17,000 students. It offers undergraduate and graduate degrees in over 100 programs. All three authors received their graduate training in evolution at this institution. The effort at UAlbany was initiated by a

doctoral student in Psychology (Spaulding). Despite substantial interest in and support for the program on campus, the effort was ultimately unsuccessful. Unlike the experiences at SUNY Oswego and the University at Alabama discussed below, the UAlbany effort terminated in the early stages, though a number of factors produced initial optimism. In the long-run, however, those elements were not enough to overcome the obstacles.

### Current level of involvement

UAlbany has a precedent for the establishment of interdisciplinary majors/minors. An interdisciplinary Neuroscience minor (Biology and Psychology) had recently been established, setting precedent for coordination between at least two of the major players in an EvoS program. In addition, the University has offered an interdepartmental major in Human Biology for some time, which combines classes from both Anthropology and Biology.

Despite this, at the time the EvoS program was proposed, UAlbany was not participating in EvoS membership (<http://evostudies.org/members/membership-criteria/>) on any level. This meant that a lot of groundwork would need to be done before the launch of any kind of EvoS program.

### Interest and support

Undergraduate and graduate students in Psychology and Biology were enthusiastic about starting an EvoS program and helped with planning in a number of ways. The undergraduates established an EvoS club to demonstrate their interest and secure funding for expenses related to establishing the new program. Several students also attended the general interest meeting. This was important because the enthusiasm of the undergraduate students suggested that if an EvoS program was established, there would be a contingent of students interested in completing the minor.

Once the faculty members predicted to be most interested in a program were identified, they were contacted by e-mail. The list included members of the “big three” on the UAlbany campus—Psychology, Biology, and Anthropology—as well as members from Geology, Economics, Nanoscience, and Biomedical Sciences. Responses were very consistent—enthusiastic but cautious and limited to those in fields directly informed by evolutionary theory (Psychology, Biology, Anthropology, and Biomedical Sciences). They all agreed it would be a valuable program and something that would fill an important need. However, with few exceptions, most responses included reservations, citing concerns of time investment, funding or both. Despite the caution, all respondents expressed support for moving forward.

At the general interest meeting, faculty members from a few additional departments indicated their interest in an EvoS program. The complete list included faculty from Anthropology, Biology, Information Technology Management, Psychology, and the School of Public Health; but when a steering committee was established, it was composed exclusively of faculty members and graduate students from Anthropology, Biology, and Psychology.

Finally, there was quite a bit of support from established EvoS programs in the SUNY system. Both Glenn Geher (SUNY New Paltz) and David Sloan Wilson (SUNY Binghamton) offered advice via e-mail. The author had the opportunity to attend an EvoS board meeting at New Paltz, which provided valuable insight into the structure of a successful EvoS program. Geher also spoke about the EvoS initiative in general and the success of the program at SUNY New Paltz during the UAlbany general interest meeting. Having the director of a thriving program at another SUNY school was an excellent way of illustrating how successful such a program can be as well as providing an excellent resource for any questions or concerns attendees had.

### Logistical factors

The first substantial obstacle involved the development of a list of classes and a method for addressing the prerequisites. Many evolution-related courses in UAlbany's Biology department require so many prerequisites that it would be prohibitive for a non-Biology major to complete them. This was true to a lesser extent in other departments as well. Over the course of 2-3 meetings, a list of classes was compiled that could fulfill EvoS program requirements, and the development of EvoS-specific classes was discussed (such as an Evolutionary Studies seminar/speaker series and an Evolution for Everyone class like those offered at Binghamton and New Paltz [Wilson, 2005]). Although progress was made, a final solution to the prerequisite issue was not reached before the initiative was tabled for other reasons as outlined below. It was also unclear who would teach EvoS-specific classes, but this most likely would have fallen to doctoral students in one of the three programs, at least in the beginning. Again, while all faculty members were supportive of the idea and willing to help in planning and implementation, they were already busy with research, teaching, committee work, and projects of their own.

It seems unlikely that the prerequisite issue alone would have been enough to prevent the establishment of an EvoS program. The question of instructors may have provided more of an impediment but also seemed to be surmountable. However, these issues certainly slowed things down and need to be addressed if the effort is revived.

### Funding

Lack of funding turned out to be a much larger obstacle. Members from all the departments stated that their department had neither funding nor additional teaching lines. However, many other sources of funding, such as the Dean of Arts and Sciences and Honors College, were mentioned. In particular, it seemed likely that funding for bringing in speakers for a seminar series could be obtained, but it was not clear if enough funding to run a successful long-term EvoS program could be raised. At the last meeting, it was decided that Spaulding should approach potential sources for funding, and this is where the process finally broke down.

### Lack of leadership figure in faculty or administration

Given that this effort was initiated by a graduate student, there was a concern about submitting grant requests to fund a program without assurance of program continuity upon her graduation. Unfortunately, none of the faculty members who had expressed interest in the program were willing or able to take a leadership position. For this reason, no funding requests were submitted, and the initiative was tabled. Obviously, even if a leader had stepped forward, success of the program would not have been assured, but lack of leadership ended the initiative before definitive progress was made.

An EvoS program is not out of the question at UAlbany. However, it requires a faculty member with the motivation and availability to lead and move the project forward. The initial groundwork has been laid, and receptive students await.

### SUNY OSWEGO

Where the UAlbany effort had a groundswell of initial support but lacked someone to follow through, an effort at SUNY Oswego was spearheaded by an assistant professor of psychology (Burch) in the institutional position to coordinate and direct an EvoS effort. The State University of New York at Oswego is a relatively small (6,000-7,000 students), four-year teaching college on the shores of Lake Ontario. Oswego also offers some Master's level programs in business, education, mental health counseling, and others. While Oswego prides itself on interdisciplinary programs and collaborations between departments, an effort to establish an EvoS minor failed for a number of reasons.

### Funding

With the recession of 2008 to present, the willingness of the administration to invest financially in new programs dropped drastically. Although the administration was technically supportive of innovative programs, particularly those that were interdisciplinary and part of a larger consortium, this was to be done without creating a strain on resources. There would be no funding given for additional staff or materials. This is not the death blow many would expect, as new academic programs can be created through the recombination of existing resources, but these new programs need to be nearly complete within the existing structure (little additional resources should be needed).

### Time and space

Both Psychology and Biological Sciences identified as "impacted" majors, having a huge number of students assigned to a relatively small number of faculty. This created inflexibility in developing a new program, opening up new courses, or diversifying the roles and workloads of faculty. The primary departments for an EvoS minor could not afford to dedicate any staff to the new core courses that would be needed. Additionally, due to new construction beginning in 2007, classroom

space was also at a premium. This restriction had obvious ramifications—even if faculty were willing to take on extra courses for the new program, there was no place to put them.

One would expect these obstacles in the development of any academic program on any campus. There is little variation in the effects of the recession on educational institutions, flexibility of departments, or scheduling difficulties. Therefore, the expectation was that, despite these obstacles, Oswego could create an interdisciplinary minor with little difficulty. The original outline for the EvoS program at Oswego was put together by an Evolutionary Psychologist (Burch). The program was to be housed in the Interdisciplinary Programs and Curricula (IPAC) Office at SUNY Oswego rather than a particular department. Meetings with administration promised a great deal of support, with the proviso that the minor be truly interdisciplinary with other departments on board. This support excluded financial support, but included space (the IPAC office), secretarial support, assistance with preparation for the program for curriculum approval, and potentially the approval of hiring lines if the program expanded or new faculty hires were justified.

Prior to presentation to the chairs of the departments involved, the program outline included courses in Anthropology, Biology, Geology, Psychology, and Cognitive Sciences and also included options for courses in any other department that examined an evolutionary perspective. The EvoS program would culminate with an interdisciplinary capstone course wherein students would integrate their previous coursework and work with other students of differing perspectives to create final projects illustrating the depth and breadth of evolutionary theory. The program in this incarnation was approved by the Chair of the Psychology Department, the Director of IPAC, and the Associate Provost.

### Difficulties in the approval process

When the program was presented to the Chairs of the various departments, suggestions were made to alter the program in ways that decreased its viability and eliminated its interdisciplinarity—the linchpin that ensured administrative support. Departments demanded that the content areas be expanded to include all the electives in their major. This would have several outcomes; in essence, the individual departments would have their own EvoS programs, students would not have to explore outside their majors to take courses, and all students in said majors would automatically graduate with a certificate in the EvoS program. This suggestion eliminated all interdisciplinarity from the program and made singular leadership of the program unwieldy. Furthermore, outside disciplines that would want to add courses to the EvoS curriculum (but not house their own) would not be accepted by the departments or enrolled in by the students.

With the suggestion that all students in these majors could take courses in their major and automatically graduate with a certificate, the required capstone was seen as an unnecessary burden and not compatible with the students' differing backgrounds—i.e., an interdisciplinary capstone would not work given that the program was no longer interdisciplinary. With the removal of all of the interdisciplinary requirements of the program, including the capstone course, there

was no longer the need for the involvement of the IPAC Office, which meant the program no longer had a home.

### Competition

Given the current state of funding and staffing, the inevitable conclusion was made: these departments could only develop their own EvoS programs if they were given additional funding by the administration for course additions, course releases, hiring lines, adjunct professors, and lab spaces. These were demands that the administration could not and was not willing to fulfill given the departments' refusal of interdisciplinarity. If administrative support was to be received, there would have to be a singular program that involved all departments.

This administrative imperative set off a series of arguments as to which department would house the program and, therefore, receive support. Several departments argued for ownership of the program, either because of the need for more lines (even if these lines were not for the EvoS program) or because their department was the most focused or based upon evolutionary theory. When a department was finally chosen, it was announced that the EvoS program could not be implemented until funding was given.

In summary, support from the administration was dependent on interdisciplinarity. The departments that were to provide it were not willing to participate in interdisciplinarity and could not support the program without additional funding. In the creation of an EvoS program at SUNY Oswego, a lack of funding, staffing, and space led to intense competition over ownership of a new, potentially funded, program. This competition led to a breakdown in cooperation, eliminating the very interdisciplinarity that might have led to more staff and support.

However, since 2008 major changes have taken place on campus. Several new enthusiastic, collaborative faculty members have been hired across disciplines. New hiring lines and funding have been made available, particularly for interdisciplinary endeavors. There have been large-scale changes in the college curriculum as well. Students now have more flexibility and fewer credit requirements, which will create a demand for more minors and interdisciplinary programs.

In conclusion, there is hope for an EvoS program at SUNY Oswego, one that is interdisciplinary and reliant on younger faculty who are interested in collaboration. The new curriculum provides obvious niches where evolutionary perspectives can be placed, and the increased academic flexibility of the students ensures that these courses will be filled. While developing an EvoS program in 2008 proved to be impossible, these changes indicate that one can be developed in the future.

## UNIVERSITY OF ALABAMA

The University of Alabama (UA) EvoS program encountered similar cross-disciplinary interest and impediments as the UAlbany and Oswego initiatives. Unlike those cases, the EvoS effort at UA ultimately succeeded because it had the motivated tenure-track faculty leadership that UAlbany lacked and the administrative



support and departmental leverage to overcome disciplinary issues not initially available at Oswego. UA, located in Tuscaloosa, AL, is the flagship public research institution for the state of Alabama with over 33,000 undergraduate, professional, and graduate. It is unclear if the larger size or status of UA in its respective state had anything to do with the EvoS success, but one unique factor that definitely and ironically played a role was Alabama's poor record of evolution education.

The UA EvoS program development was initiated by a newly arrived assistant professor of anthropology (Lynn) in the fall of 2009, coincident with the publication of Mead and Mates' (2009) state-by-state evaluation of K-12 evolution education. It was no surprise to anyone who has grown up in Alabama that their state ranked 50<sup>th</sup> and received a grade of "F," and it made the argument for a college-level EvoS program obvious. It was agreed that basic liberal arts and science education should expose students to fundamental theories for explaining life and behavior, which an EvoS program could provide, as well as influence positive change by training students who contribute to improvements in their respective communities and through outreach programs. Another advantage UA had in making this happen was that many of the pieces were already in place.

### **Faculty interest, leadership, and administrative support**

Given the four EvoS membership levels of participation (<http://evostudies.org/members/membership-criteria/>), UA was almost a level 3—a program with a campus-wide seminar series—but had not formalized it, developed an introductory course, or affiliated with the EvoS Consortium. The Evolution Working Group (EVOWOG) at UA was started 7 years ago by faculty with shared interest in researching and teaching evolution to host the Alabama Lectures on Life's Evolution (ALLELE) speaker series. This series has hosted numerous eminent speakers over those years, and the EvoS initiative merely had to build upon this scaffold.

Funding for the EvoS program has largely been directed toward maintaining the ALLELE series. After exhausting outside sources obtained in the first few years, EVOWOG members began approaching internal departments and programs. The College of Arts & Sciences provides the bulk of the funding for the series but requires EVOWOG to match this contribution. EVOWOG members do this by annually requesting sponsorship from any UA department or program for which evolution is relevant in exchange for input in speaker selection and promotion through all advertising. While this approach works, it is difficult each year for faculty to engage in fundraising and event-hosting, as well as to obtain consistent pledges from the same sponsors, as budgetary constraints shift.

Because of these factors, it was essential that tenure-track faculty members be willing and able to take on the extra work to follow things through, which Lynn and EVOWOG chairperson Leslie Rissler committed to do. Of equal importance, departmental and college administrators supported the effort. The Anthropology Department, in which the UA EvoS program is housed, does not require new professors to "pay dues" by taking on onerous introductory courses and encourages new professors—which were being added to an expanding department until recent budget restriction—to develop courses they would enjoy teaching and,

consequently, that students would enjoy taking. Thus, the UA EvoS program was proposed during a relatively unique window of support for the development of new courses and coordination of curricula across disciplines.

### Logistics of starting interdisciplinary minors

Curricular flexibility was important because there is no formal process for starting a minor at UA. Relevant courses already on the books at UA were culled from the course catalog, and instructors were contacted to verify that they were appropriate for inclusion in the minor. An introductory team-taught course was developed and a formal proposal to teach this new course submitted. Hypothetical requirements of the minor were outlined and the proposal sent to EVOWOG members and department chairpersons for feedback and support.

At this point, impediments that have stalled programs at other institutions were encountered. The development committee was challenged to demonstrate the utility of an EvoS program and student interest if it were approved. The proposal needed to emphasize that an EvoS program would inculcate critical interdisciplinary thinking through the guiding focus on evolutionary principles. Additionally, student interest was assessed using a simple internet survey, and these data were circulated with the proposal.

### Distributing the responsibilities of interdisciplinarity

The proposal was placed on the agenda for the next full faculty meeting for the College of Arts and Sciences, but, because of poor communication, several people who had not been informed were taken aback that the initiative had proceeded so far without their knowledge, consultation, or inclusion. This was handled by postponing a vote. There was additional concern over housing the leadership in Anthropology, since evolution is based on biological principles; but the Biological Sciences Department did not have the available resources to assume leadership, and Anthropology was the only department willing and able to do so. Nevertheless, it was considered pragmatic to share the directorship across multiple departments, beginning with Anthropology and Biological Sciences. This partnership reached out directly to all parties who had not previously been included and negotiated accommodations.

Another stumbling block was the integration of an upper-level Biology course called "Evolution" because of its numerous prerequisites. It was agreed that this would be too advanced for EvoS minors who were not also Biology majors, which was a problem, since (1) it was hoped the EvoS minor would have broad appeal and (2) because Biology majors are not required to declare minors. Furthermore, the enrollments in the Biology major and service demands on faculty were so high that the creation of a new course for this minor wasn't practical. A compromise was negotiated with Biological Sciences to forego teaching a low enrollment course and develop a lower-level course in biological evolution with no prerequisites.

Finally, it was decided that a concluding capstone course should also be developed akin to the team-taught introductory course but that it be offered in Biology, though it later fell back to Anthropology due to these same resource

constraints. To manage this, the introductory and concluding courses are concurrent and meet together, which works because of the team-approach taken and variation of the team from semester to semester (see Appendix B for the full, current list of EvoS requirements at UA).

### Sustaining the program

Since approval, the UA EvoS minor has enrolled over 20 students. However, education scholar Karri Holley (2009) points out that interdisciplinary programs tend to lack a sense of being “real” to students unless they have a tangible location and organization, a consistent and interactive cohort of students, or synergistic extracurricular opportunities for students to get involved with each other. In a partial effort to meet these standards, students were encouraged to start an EvoS club and host an annual Darwin Day colloquium, which required several months of synergistic interaction. One-credit research and reading courses were also inserted between the capstone courses to keep students involved through an evolution-oriented project they develop in the introductory course and through the ALLELE series, which puts them in direct contact with visiting lecturers.

In summary, the key to the current status of the UA EvoS program was having a person willing and able to be persistent but patient with bureaucratic processes, the assistance of someone in the university with enough leverage to push through roadblocks, and the support of administrators. The embarrassment of being worse than arch-rivals Mississippi in K-12 evolution education didn't hurt. Yet the future is still uncertain, as it may prove even harder to sustain a program once the initial excitement is over.

## CONCLUSION

Much like evolutionary processes, each of the aforementioned institutions has tried to create a program by tinkering with existing materials, and that program has attempted to survive against various selection pressures. Many of these pressures are the same—resource strains, curricular inflexibility, competition, and territoriality. The evolutionary allusions are quite obvious. With proper preparation—and therefore knowledge of one's respective academic ecosystem—many of these obstacles can be surmounted.

However, just as in evolutionary processes, variation is critical. There is no tried and true path to curricular approval, even in strikingly similar institutions. Evolutionary programs can be created through any number of collaborations and interdisciplinary efforts. For SUNY Oswego, this path now appears to be through Human Development, Global Studies, and World Awareness requirements. Just as in evolutionary processes, environmental change is inevitable. Failure in the past does not mean a niche will not change and become hospitable in the future. For example, the addition of one key "spark plug" figure at UAlbany could be enough to overcome other obstacles there and successfully establish a program. The same is true in maintaining a program, which is now Alabama's biggest obstacle. The path to establishing a program may not be the one that sustains it. Without the essential but variable ingredients to maintain the fecundity of an EvoS program, it can easily

go extinct. The key to creating an enduring Evolutionary Studies program is to be flexible, seek out new niches, and take advantage of hospitable environments, even if they appear in unexpected places.

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## APPENDIX A

### SUNY OSWEGO MINOR REQUIREMENTS

#### Evolutionary Studies Minor Form

When filing for graduation, bring a signed copy of this document to the Registrar with a copy of your degree application. To obtain a certificate in the Evolutionary Studies minor, you must take at least 18 credits within the following framework. Only 6 of these 18 credits can be earned within your major.

#### I. Foundation Courses (6 or more credits)

Note that other courses not included in the subsequent list may also count toward this category (students may petition their advisors to have other courses count and, in such cases, will need to provide evidence to support their petition (e.g., the syllabus and/or textbook of a particular course). Only one course within your major may be taken towards the minor.

_____	ANT 111	Archaeology and Human Evolution <sup>GE</sup>
_____	BIO 207	Understanding Evolution <sup>GE</sup>
_____	GEO 100	Physical Geology <sup>GE</sup> <u>or</u>
		_____ OCE 100 Oceanography
_____	PSY 270	Evolution and the Behavioral Sciences (NEW COURSE) <sup>GE</sup>
_____	COG 266	Brains, Minds and Consciousness

#### II. CONTENT AREAS (9 or more credits from at least two different departments)

A: Courses that necessarily count toward the content-areas category. Six credits must be upper division.

_____	ANT 280	Biological Anthropology
_____	ANT/BIO 303	Ethical Treatment of Nonhuman Primates <sup>GE</sup>
_____	ANT 369	Human Sexuality: Cross-Cultural Studies <sup>GE</sup>
_____	ANT 383	Disease and Human Behavior. Prerequisites: 9 hours of Social and Behavioral Sciences including Ant 111 or 112
_____	ANT 480	Human Sociobiology. Prerequisites: junior standing/15 Social and Behavioral Sciences hours or Bio major, and Ant 280
_____	AST 360	Human Futures <sup>GE</sup>
_____	BIO 120	Molecular and Cellular Foundations <sup>GE</sup>
_____	BIO 315	Genetics. Prerequisites: Biology 120.
_____	BIO 200	Environmental and Population Biology <sup>GE</sup>
_____	BIO 320	Introductory Ecology
_____	BIO 325	Behavioral Biology

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_____	BIO 340	The Plant Kingdom
_____	BIO 370	The Animal Kingdom
_____	BIO 400	Current Issues in Environmental and Population Biology <sup>GE</sup>
_____	BIO 425	Evolution. Prerequisites: Bio 315
_____	COG 166	Introduction to Cognitive Thinking
_____	GEO 200	Historical Geology: Prerequisites: Geo 100 or Oce 100
_____	GEO 440	Paleontology
_____	PSY 301/401	Perception 301 (Prerequisites: PSY 100) Perception 401 (Prerequisites: PSY 290)
_____	PSY 302/402	Psychology of Learning 302 (Prerequisites: PSY 100) Psychology of Learning 402 (Prerequisites: PSY 290)
_____	PSY 303/403	Biopsychology 303 (Prerequisites: PSY 100) Biopsychology 403 (Prerequisites PSY 290)
_____	PSY 322	Child Development*
_____	PSY 340	Social Psychology*
_____	PSY 363	Cognitive Neuroscience*
_____	PSY 370	Evolutionary Psychology*
_____	PSY 377	Human Sexuality*

<sup>GE</sup> Fulfills General Education Requirement

\* PSY 100 prerequisite for all 300 level psychology courses.

**B:** Courses that *may* count toward the content-areas category; such courses need to be considered under advising with an EvoS advisor. Note that other courses not included in the subsequent list may also count toward this category (students may petition their advisors to have other courses count and, in such cases, will need to provide evidence to support their petition (e.g., the syllabus and/or textbook of a particular course)). ANT 399 Independent Study

ANT 499	Independent Study
BIO 492	Research
BIO 497	Senior Honors Thesis
BIO 499	Independent Study
GEO 399	Independent Study
GEO 499	Independent Study
PSY 490	Research Seminar
PSY 499	Independent Study
PSY 441	Theories of Personality
OTHER _____	(course title)

**III. Evolutionary Studies Seminar** (3 or more credits (may be taken twice; up to 6 credits))

\_\_\_\_\_ XXX Evolutionary Studies Seminar (NEW COURSE). This course will consist of: on and off campus speakers on various evolutionary topics, papers and discussions of speakers and their research, student projects and lectures (students teaching other students outside their discipline) and peer review of student projects and lectures. Teaching of course can rotate through departments or be co-taught.

Note: Additional offerings such as ‘special topics’ courses and special seminars within departments may be able to count toward this component of the curriculum (consult with EvoS advisor if you feel that such a course should be included)

## APPENDIX B

### UNIVERSITY OF ALABAMA MINOR REQUIREMENTS

#### **Courses in the minor (20 credits total)**

The minor is designed to be taken over the course of your time at UA, beginning with “Evolution for Everyone.” In this course, you will be introduced to evolutionary principles and a cross-section of applications of these principles. You will also outline an evolutionary project you can do while a UA undergraduate. In subsequent semesters, while taking other minor requirements and electives, you will take a 1-credit “Readings in ALLELE” course to stay involved with other students in the minor and a 1-credit “Independent Research” in conjunction with a faculty mentor in your primary discipline. In conjunction with this mentor, you will conduct the project you outlined during the first semester. In your final EvoS semester, you will take “Advanced Evolutionary Studies and Big Questions,” which will again expose you to the principles and applications but which you will be able to integrate more deeply. Additionally, you will write-up your project results for submission to a student-level peer-reviewed publication. It is hoped that this course of study, while not as rigorous as a major, will enable you to be constructive critics of cultural use of evolutionary principles and prepare you for further studies.

#### **Introduction**

- **FLC 101, Evolutionary Attitudes, 1cr**  
This optional 1-credit course is a part of the Freshman Learning Community program. It is offered occasionally in the fall. Students take this in conjunction with an introductory course in anthropology or psychology. The focus is on viewing and discussing pop cultural depictions of evolution. The forum is informal and evaluated based on attendance and participation.

#### **Required “Foundation” Courses (12 credits)**

- **ANT 150, Introduction to Evolutionary Studies** (*no prerequisites*), 3cr  
This team-taught course is the introduction to the minor. The objective is to expose students to the array of applications for evolutionary theory across the natural, social, and applied sciences and humanities. It features an array of guest lectures from across the university that changes each semester, as well as visits by ALLELE lecturers. Students design a project (based in the discipline of their major) that will be completed over the course of the minor and review a trade book for possible publication. It is offered every spring semester.
- **BSC 220, Principles of Biological Evolution** (*no prerequisites*), 3cr  
This course is an introduction to the process and patterns of biological evolution. It is geared for non-biology majors. It is offered approximately every two of three semesters.



- **ANT 450, Advanced Evolutionary Studies and Big Questions** (*prereqs: ANT 150, BSC 220*), 3cr  
This is the concluding course of the minor and should be taken in one's final spring semester. It meets concurrently with ANT 150 and features the same format. It's intention is to review basic mechanisms with the purpose of a deeper integration of principles and provide students exposure to a different set of instructors and ALLELE guests. Students present results from their minor project and, if relevant, submit it to a peer-reviewed journal for publication consideration. It is offered every spring.

One of the following:

- **ANT 270, Physical Anthropology**, 3cr
- **GEO 102, Earth Thru Time**, 4cr
- **PHL 387, Philosophy & Evolution** ("W"), 3cr

#### **Integrative Courses (2 credits)**

- **ANT 431, Readings in ALLELE**, 1cr  
This 1-credit course involves meetings to discuss readings of ALLELE guests scheduled for the semester. Students attend ALLELE lectures and meetings as a group with ALLELE speakers for direct opportunity for in-depth discussion. The course is designed to ensure that students stay integrated in the EvoS program since, as an interdisciplinary minor, students are not taking evolution courses as part of a specific department or with a cohort. Can be arranged any semester between ANT 150 and ANT 450.
- **Independent Research**, 1 cr  
This -credit course is designed to provide an opportunity for students to collect data or complete their minor project. Students are mentored by a faculty member in their major. Arrangements should be made to take this between ANT 150 and ANT 450 and register for credit in their mentor's discipline. Credit will be manually assigned to the EvoS minor.

#### **Elective "Context" Areas (6 or more credits from at least TWO DIFFERENT departments that are not your major)**

Anthropology electives:

- **ANT 270, Physical Anthropology\***, 3cr
- **ANT 208, Anthropology of Sex**, 3cr
- **ANT 275, Race, Ethnicity, & Variation**, 3cr
- **ANT 311, Population, Health, & Origins** (*prereqs: ANT 100 or 270 or permission*), 3cr
- **ANT 312, Non-Human Primates** (*prereq: ANT 101 or 270 or permission*), 3cr
- **ANT 471, Fossil Humans and Evolution** (*prereq: ANT 270 or perm*), 3cr
- **ANT 473, Human Osteology** (*prereq: ANT 270 or permission*), 3cr

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- **ANT 475, Biology, Culture, & Evolution** (*prereq: ANT 100, 270 or permission*), 3cr
- **ANT 479, Human Paleopathology** (*prereq: ANT 270 or permission*), 3cr

Astronomy electives:

- **AY 155, Life in the Universe**, 3cr

Biological Sciences electives:

- **BSC 315, Genetics** (*prereq: BSC 114:115 or BSC 118, & CH 101:102 or 117 and 118*), 3cr
- **BSC 373, Vertebrate Zoology** (*prereq: BSC 114:115 or 118 & 116:117 or 120*), 4cr
- **BSC 400, Vertebrate Functional Morphology** (*prereq: BSC 114:115 or 118 & 116:117 or 120; 300*), 4cr
- **BSC 420, Principles of Systematics** (*prereq: BSC 483 & 360, 373 or 376*), 3cr
- **BSC 428, Biology of Fishes** (*prereq: BSC 373 & 385*), 3cr
- **BSC 441, Developmental Biology** (*prereq: BSC 300 & 315*), 3cr
- **BSC 448, Animal Behavior** (*prereq: BSC 385 or permission*), 3cr
- **BSC 434, Plant Systematics** (*BSC 114:115 or 118 & 116:117 or 120*), 4cr
- **BSC 464, Biology of Algae** (*prereq: BSC 114:115 or 118 and 116:117 or 120*), 4cr
- **BSC 482, Conservation Biology** (*prereq: BSC 114:115 or 118, 116:117 or 120*), 3cr
- **BSC 483, Evolution** (*prereq: BSC 220*), 3cr

Geology electives:

- **GEO 102, Earth Thru Time\***, 4cr
- **GEO 355, Invertebrate Paleontology** (*prereqs: GEO 102 or BSC 376 or permission*), 3cr
- **GEO 367, Sedimentology & Stratigraphy** (*prereq: GEO 102 & 210 or permission*), 3cr
- **GEO 401, Paleoclimatology** (*prereq: GEO 101 or 102 or permission*), 3cr
- **GEO 462, Quaternary Climates & Environments** (*prereq: GEO 401 or permission*), 3cr

History electives:

- **HY 400, Darwin, Evolution & Revolutions**, 3cr

Philosophy electives:

- **PHL 387, Philosophy & Evolution\*** (*prereq: 6cr in PHL or permission*), 3cr
- **PHL 367, Philosophy of Cognitive Science** (*prereq: 6cr in PHL or permission*), 3cr

- **PHL 390, Art & Human Nature** (*prereq: 6 credits in PHL or permission*), 3cr

Psychology electives:

- **PY 313, Sensation & Perception** (*prereq: PY 101 or permission*), 3cr
- **PY 352, Developmental Psychology** (*prereq: PY 101 or 105 or permission*), 3cr
- **PY 372, Social Psychology** (*prereq: PY 101 or 105 or permission*), 3cr
- **PY 413, Physiological Psychology** (*prereq: PY 355 or permission*), 3cr

University Honors:

- **UH 300, Topics in Vertebrate Paleontology**, 3cr
- **UH 300, Primate Religion & Human Consciousness**, 3cr

\* if not taken as Foundation course

## APPENDIX C

### UNIVERSITY AT ALBANY PRELIMINARY LIST OF PROPOSED COURSES FOR MINOR

Below is a list of the proposed courses for the Evolutionary Studies Minor. This list was never finalized and likely would have included courses from other departments if the minor had been established. Any prerequisites listed represent current prerequisites for the listed course. Again, if a minor was established, some of these may have been changed to allow for easier access by Evolutionary Studies minors.

#### Evolutionary Studies Courses:

- Introduction to Evolutionary Studies, 3 cr
- Evolutionary Studies Seminar Series, 3 cr

#### Anthropology Courses:

- **AANT 100, Culture, Society, and Biology**, 3cr
- **AANT 110, Introduction to Human Evolution**, 3cr
- **AANT 211, Human Population Biology** (*prereqs: AANT or ABIO 110 or ABIO 120 recc*), 3cr
- **AANT 310, Human Paleontology** (*prereq: AANT 110*), 3cr
- **AANT 409, Primate Evolutionary Biology** (*prereq: AANT 110*), 3cr
- **AANT 414, Demographic anthropology** (*prereqs: AANT 110 and 211*), 3cr
- **AANT 416, Topics in human biology** (*prereqs: AANT 110 and 211*), 3cr
- **AANT 419, Human Evolutionary and Environmental Physiology** (*prereqs: ABIO 110 or 120 and 122; and 111 or 121 and 123*), 3cr

#### Biology Courses

- **ABIO 120 General Biology 1**, 3cr
- **ABIO 121 General Biology 2** (*prereq: ABIO 110 or 120*), 3cr
- **ABIO 199 Contemporary Issues in Biological Sciences**, 1cr to 3cr
- **ABIO 205 Human Genetics** (*prereqs: ABIO 110 or 120, and 111 or 121*), 3cr
- **ABIO 209 The Human Organism**, 3cr
- **ABIO 212Y Introductory Genetics** (*prereqs: ABIO 110 or 120 and a grade of C or better in ABIO 111 or 121*), 4cr
- **ABIO 316 Biogeography** (*prereq: AMAT 106 or APHY 140*), 3cr
- **ABIO 317 Comparative Animal Physiology** (*prereqs: ABIO 110 or 120 and ABIO 111 or 121 and jr. status*), 3cr
- **ABIO 318 Human Population Genetics** (*prereq: AANT 211 or ABIO 205 or 212Y*), 3cr
- **ABIO 320 Ecology** (*prereqs: AMAT 106 or APHY 140, ABIO 212Y*), 3cr

- **ABIO 325 Comparative Anatomy of Chordates** (*prereqs: 12 credits of biology or permission of instructor*), 4cr
- **ABIO 329 Genetics of Human Disease** (*prereq: ABIO 212Y*), 3cr
- **ABIO 335 Immunology** (*prereq: ABIO 365*), 3cr
- **ABIO 343 Evolutionary Biology and Human Health** (*prereq: a course in genetics*), 3cr
- **ABIO 397 Topics in Biology** (*prereq: jr. or sr. status*), 1cr to 3cr
- **ABIO 402 Evolution** (*prereq: ABIO 212Y*), 3cr
- **ABIO 432 Animal Behavior** (*prereqs: 15 credit hours in bio and AMAT 106*), 3cr

Psychology courses

- **APSY 385 Evolutionary Psychology** (*prereq: APSY 101*), 3cr