Course Title: ***Socio-Environmental Synthesis and Sustainability Research***

Instructors: Matthew C. LaFevor, Postdoctoral Fellow at SESYNC; David Hawthorne, Associate Professor, Department of Entomology; and Jampel Dell'Angelo, Postdoctoral Fellow at SESYNC.

Short description: This is an interactive, interdisciplinary course that addresses current synthesis research approaches to human-environment and sustainability issues.

Targeted audience: Graduate students with an interest in sustainability topics and emergent interdisciplinary research approaches.

Potential dates and meeting times: Fall semester 2015, meeting once each week for 150 minutes.

Number of credits: 3

This course introduces students to the theory and practice of socio-environmental synthesis (SES) as a tool for informing environmental decisions. The course will have 3 phases. The first phase will be a lecture and discussion based introduction to the integration of social and bio-physical sciences when addressing environmental challenges. Theoretical and practical elements of transdisciplinary socio-environmental research will be introduced. The second phase will be a series of SES case studies presented by local researchers, including postdoctoral fellows working at SESYNC (The Nation Socio-Environmental Synthesis Center). Each case study will highlight disciplinary perspectives, research tools and target audiences. The final phase will include student synthesis projects, their development and presentation.

This course is unique in its emphasis on the diverse conceptual and methodological foundations of SES and student exposure to ongoing SE research conducted at a top socio-environmental research center. The course introduces graduate students to the practical aspects of socio-environmental research design, team science and grant writing.

Students' expected outcomes: This course provides an opportunity for the development and consolidation of a theoretical background for sustainability research; improving students ability to think critically about contemporary socio-environmental issues and actionable human-environment research; increasing student understanding of a variety of interdisciplinary/transdisciplinary approaches and research methods; development of 'real-world' connections with practical research; participatory learning of the fundamentals of writing a grant proposal; improving team work, collaboration, and presentation skills.

Course structure:

Part I: weeks 1 to ~4

<u>Theory and Background to Socio-Environmental Synthesis and Sustainability research</u>.
The first course section (Part I) would focus on the following topics:

a. Introduction to S-E Synthesis
b. Intro to SESYNC?
c. Overview of theory and practice of sustainability
d. Overview of research approaches and methods
e. Systems research
f. What do we mean by "socio"
g. What do we mean by "environmental"
h. How, what, when, where, and why integrate them?
i. Importance of beginning with case studies, then expanding
j. The Age of Big Data: Good and Bad
k. Explanation of final project expectations
l. Intro guide to students' forming research questions, finding data, forming groups, methods
m. Science of team science
n. Primer on data acquisition methods
o. More in depth primer on available methods and analysis

Part II: weeks~5 to ~11

<u>Socio-Environmental Synthesis Case Studies</u>. This course section would incorporate the participation of invited researchers. A number of SESYNC researchers (mostly postdocs) would present ongoing research projects, introducing their respective research designs, methods and tools. As a result, students would be exposed to an array of socio-environmental research projects and would learn a diverse set of research tools and methodologies. Additionally, students would be invited to engage with an "external advisor," selected from the group of invited speakers. The advisor would provide support for students in completing their final course project.

p. Presentation skills and techniques
q. ~ 10 different socio-environmental research projects presented by different researchers
r. Illustration and discussion on different research design, methods and tools
s. Students reach out to the invited speakers and speak about 'external supervision' for their course final work

Part III: week ~12-15

<u>Presentations and grant writing</u>. This course section would focus on three main aspects of Socio-Environmental research: (1) Team work and interdisciplinary collaboration; (2) Presentation skills and techniques; (3) Grant proposal development and submission. These element would guide students' final projects – an original research proposal, submitted to and evaluated by researchers from SESYNC.

t. Team presentations
u. Course final project feedback and advice
v. Submission of team proposals