



GRADUATE HANDBOOK 2013-2014

August 2013

(DRAFT since some additional information needs to be added about the capstone requirement; Other information, including the curriculum requirements are final for the 2013-2014 academic year)

Master of Sustainable Solutions (MSUS)

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Purpose of the Handbook

This handbook is a very important guide for graduate students admitted to the School of Sustainability (SOS), and for individuals who wish to apply to the Master in Sustainable Solutions (MSUS) program. Each current and prospective student should consult the handbook for information about the MSUS.

The handbook is provided as an initial resource for answers to questions about the program, but students are also encouraged to consult with the graduate coordinator, their faculty advisor or any member of the Graduate Committee. The primary reference for graduate students on rules and regulations is the Arizona State University [Academic Catalog](#). Each student should become familiar with the Academic Catalog and the [Office of Graduate Education](#) website and policies.

Once admitted to the School of Sustainability, students have access to the SOS Graduate Student Community Blackboard site, where they will be able to find many of the materials in this handbook. Admitted students can access the site through [MyASU](#).

Student Responsibility

It is the responsibility of each student to understand and observe all procedures and requirements specified by the Office of Graduate Education and the School of Sustainability. **It is a *requirement* for all SOS students to read and understand the SOS Graduate Handbook and the ASU Academic Catalog.** Faculty and staff provide academic advice and assistance; however, the ultimate responsibility for meeting degree and other requirements remains with the student. All ASU students are also required to have an active ASU email account and to check it frequently. Students may forward their ASU email to another preferred account. [Instructions on how to do this are found online.](#)

Academic Integrity

Graduate students are expected to be ethical in their multiple roles as students, researchers, teachers or supervisors of undergraduate students and representatives of the School, Institute and University. When in doubt about appropriate conduct, students should consult a faculty mentor to seek clarification. Breaches of academic integrity include, but are not limited to, the following:

- Engaging in any form of academic deceit, e.g., referring to materials, sources or devices (camera phones, text messages, crib sheets, solution manuals, materials from previous classes or commercial research services) not authorized by the instructor for use during an evaluation or assignment;
- Providing inappropriate aid to another student in connection with any evaluation or assignment;
- Engaging in plagiarism by using the ideas, words or data of another person or persons without full and appropriate attribution;
- Engaging in plagiarism by claiming credit for the ideas, words or data of another person or persons, or submitting work done by another as one's own;

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- Failing to follow ethical procedures for research involving human subjects, such as violating participants' confidentiality, or failing to maintain confidential or sensitive research data in a secure location;
 - Knowingly using data that do not meet appropriate standards for reliability and validity;
 - Failing to meet responsibilities to undergraduate students, such as failing to provide assistance during designated office hours;
 - Engaging in a romantic relationship with an undergraduate student whom the student supervises or evaluates in a classroom or research setting;
 - Falsifying or misrepresenting hours or activities in relationship to an internship, externship, research assistantship, field experience, workshop or service learning experience;
 - Repeatedly failing to meet commitments and responsibilities, such as chronically missing deadlines, or failing to provide work promised to colleagues; and
 - Behaving in a way that reflects poorly on the School, Institute and University while conducting research or participating in community activities as a representative of the School.

The School of Sustainability has a zero-tolerance policy for any form of academic malfeasance. Penalties for unethical behavior range from being placed on academic probation to dismissal from the program. Additional information about academic integrity policies of the University is available on the [Student Rights and Responsibilities website](#).

Sexual Harassment

The University prohibits sexual harassment by employees and students and will not tolerate sexual harassment that interferes with an individual's work or educational performance or creates an intimidating, hostile or offensive working, learning or residential environment. [Additional information about sexual harassment can be found online](#).

Campus Safety

To report an emergency on campus, students can simply dial 911 or use one of the emergency call boxes found on campus. Non-emergency ASU Police or campus-safety matters should be directed to 480-965-3456. ASU has an opt-in, text-message alert system by which students can choose to receive a text message from ASU in times of an emergency. Students can [sign up for the service online](#). For additional safety resources and contacts, such as Counseling Services, Police and Safety Escort Services, visit the [Safety Resources](#) website.

What is the School of Sustainability?

The School of Sustainability was established to educate a new generation of leaders, through collaborative learning, transdisciplinary approaches and solutions-oriented training, to address some of the most pressing environmental, economic and social challenges of this century.

SOS builds on the extensive urban-environmental research portfolio of the [Global Institute of Sustainability](#) (GIOS) and the vision of the [New American University](#), to provide innovative education and research opportunities that will prepare students to find solutions to sustainability challenges relating to:

- Business Practices and Economics
- Climate Change and Adaptation
- Ecosystem Alteration and Biodiversity
- Energy, Materials and Technology
- Food Systems
- Future Scenarios and Systems Thinking
- International Development
- Policy and Governance
- Social and Behavioral Change, Ethics
- Urbanization
- Water Quality, Use and Supply

These challenge areas are part of the focus of the School's graduate curriculum.

The goals of SOS and GIOS include:

- Identifying the grand challenges of sustainability.
- Advancing knowledge for applied practical solutions.
- Creating new tools for improved decision-making.
- Prioritizing university-wide efforts toward sustainable practices.
- Building global research partnerships.

Graduate Degrees Offered

SOS offers the Master in Sustainable Solutions (MSUS) non-thesis degree. Also offered is the Master of Arts (MA), Master of Science (MS) and Doctor of Philosophy (PhD) degrees in sustainability. MSUS degree programs are described in the sections below.

The SOS graduate program is designed to increase students' understanding of systems dynamics, cascading effects, and scale, and to develop their ability to work on transdisciplinary teams to address sustainability challenges. After completing the program successfully, students will be able to:

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- Understand the nature of coupled social and ecological systems;
 - Evaluate the cascading effects and tradeoffs of policies, decisions and actions related to sustainability;
 - Consider scale in the design and implementation of research questions, programs and policies;
 - Demonstrate epistemological agility and literacy in multiple “conceptual languages;”
 - Integrate methods from multiple disciplines to design interdisciplinary research, creative activities and applied projects;
 - Lead and participate effectively in teams comprised of members from many disciplines;
 - Communicate effectively with colleagues, policy makers and the general public in both formal and informal settings; and
 - Employ responsible and ethical research and applied practices that consider both intergenerational and intragenerational equity in their design and implementation.

Who Should Apply?

SOS encourages applications from individuals with educational backgrounds and experience relevant to the School’s goals and challenge areas. Before applying, the prospective student should discuss with the graduate coordinator or a faculty member whether or not SOS offers a graduate degree that will meet the student’s needs. The MSUS program is offered during the day, and although there are a few online and evening courses, the programs cannot be completed online or in the evening.

Please see the SOS website for answers to [frequently asked questions](#) about the application process or applicants can contact our student services center at 480-727-6963 or schoolofsustainability@asu.edu.

Application Deadlines

The School of Sustainability admits applicants to the MSUS program for the fall and spring semesters. For admission to the spring 2014 semester, complete applications including GRE scores and recommendations must be received by **Sept. 15, 2013**. For the fall 2014 semester, complete applications including GRE scores and recommendations must be received by **Dec. 15, 2013**. Late applications will not be accepted. Students must apply directly through the ASU Office of Graduate Education.

Application Process and Admission Requirements

The School of Sustainability's MSUS [graduate application process webpage](#) lists current application requirements and deadlines for applying to the MSUS in sustainability.

Note: Taking courses for graduate credit as an undergraduate or non-degree student does not ensure admission to the program or acceptance of the acquired graduate credits as part of the plan of study.

Competencies

Transcripts will be used to evaluate basic competencies for graduate study in sustainability. Students with inadequate preparation may be required to remediate deficiencies as part of their program requirements.

International Students

SOS welcomes applications from international students. International students must meet ASU's general requirements for admission into graduate programs. The ASU [Office of Graduate Education has additional requirements for international students](#) and more information can be found on [ASU's Global Education](#) website.

Review Process

The SOS Graduate Committee will review an application when the School of Sustainability has received all application materials from the Office of Graduate Education and after the Sept. 15 and Dec. 15 deadlines. Applicants can check the status of their application through [MyASU](#).

Master's in Sustainable Solutions Degree (MSUS)

Continuous Enrollment

Once admitted to a graduate degree program, master's students must be registered for a minimum of one credit hour (not audit) during all phases of their graduate education. This includes periods when they are engaged in research; working on or defending their thesis or applied project; or in any other way using university facilities or faculty time including the term in which they graduate.

Registration for every fall and spring semester is required. Summer registration is required for students who are completing culminating experiences or graduating from the degree program.

To maintain continuous enrollment, credit hours must appear on the student's plan of study and be Continuing Registration (SOS 595) or a graduate-level course.

Grades of "W" (withdrawal) or "X" (audit) are not considered valid registration for continuous enrollment purposes. "W" grades are received when students officially withdraw from a course after the course drop deadline. "X" grades are received for audit courses. Additionally, students completing work for a course in which they received a grade of "I" (incomplete) must maintain continuous enrollment as defined previously. Graduate students have one year to complete work for an [incomplete grade](#); if the work is not complete and the grade changed within one year, the "I" grade becomes permanent.

Students planning to discontinue enrollment for a semester or more must request approval for a leave of absence. Students may [petition the Office of Graduate Education](#) for a leave of absence for a maximum of two semesters during their entire program. A petition for a leave of absence, endorsed by the student's faculty advisor and the graduate director, must be approved by the Office of Graduate Education. This request must be filed and approved before the anticipated absence.

A student on leave is not required to pay fees, but in turn is not permitted to place any demands on university faculty or use any university resources. Students who do not enroll for a fall or spring semester without an approved leave of absence by the Office of Graduate Education are considered withdrawn from the university under the assumption that they have decided to discontinue their program. Students removed for this reason may reapply for admission to resume their degree program; the application will be considered along with all other new applications to the degree program.

Advising

Role of the Graduate Coordinator

The graduate coordinator is available to students to help explain department and university policies and procedures. Any question about paperwork, university policies or services should be addressed first to the graduate coordinator, who will answer the question or make a referral to the appropriate university office or personnel. All questions regarding coursework applied toward the degree or the culminating

experience requirement should be addressed to the student's faculty mentor/ advisor.

Role of the Faculty Mentor or Advisor

Students are assigned an initial faculty *mentor* when they enter the program. The mentor's role is to assist the student with choosing appropriate classes at the beginning of their program and help identify a more permanent faculty advisor. The mentor may become the student's faculty advisor but this is not always the case. The potential advisor must agree to participate in this role.

A student's first responsibility is to meet with several faculty members with the intent of identifying one who will serve as the student's *advisor* throughout the program. Students are encouraged to consult with their faculty mentor or advisor prior to registering for classes each semester to ensure classes will contribute to degree completion.

Faculty Advisor Participation Eligibility

The faculty advisor must be a [SOS faculty member](#) or [approved by the Office of Graduate Education](#) to serve as your faculty advisor and must meet certain criteria. Usually, only tenured or tenure-track faculty are granted advisor approval. Please check with the graduate coordinator about advisor eligibility if there are any questions. Faculty Advisors are typically ASU faculty members (not limited to SOS teaching faculty) or a [Sustainability Scientist or Scholar](#).

Some requests may need to be submitted to the Office of Graduate Education for approval using one of the appropriate [Committee Approval](#) forms. Questions about faculty approvals and university procedures can be addressed to the graduate coordinator.

Establishing a Faculty Advisor

All students are expected to identify a faculty advisor no later than the middle of the second semester in the program. The plan of study (iPOS) is due by March 1 for students that start their program in fall and November 1 for students that start their program in spring. The student must list faculty advisor on the online iPOS in order to submit it. Therefore, the student is encouraged to establish the advisor by the end of the first semester or near the beginning of the second semester to meet the deadline.

To establish a faculty advisor, the student must ask the potential faculty advisor if he or she is willing to take on the student as their advisee. If the student wants to work with two faculty members, who will both serve as advisors, then the roles will be co-advisors. In a co-advisor situation, both faculty need to be aware that they are co-advisors and be informed of who is serving as the other co-advisor. Approval from both is required.

The student will list the confirmed advisor or co-advisors on the plan of study (they are referred to chairs or co-chairs on the plan of study). The graduate coordinator will follow up with the student and the faculty if additional paperwork is requested by the Office of Graduate Education.

Students who are unable to establish a faculty advisor should consult with their assigned mentor or Dr. George Basile, the MSUS Faculty Coordinator.

Once a faculty advisor has been established, students work with their advisor to map out their entire degree progression (plan of study).

Plan of Study

An interactive plan of study (iPOS) must be filed online via [MyASU](#) with the Office of Graduate Education. The iPOS is a formal plan to meet degree requirements. It includes all courses to be taken and the designation of a non-thesis experience. The iPOS is an agreement that the work specified on the iPOS will be sufficient for the desired degree. Master's students should submit the iPOS online by March 1 (for fall start students) or November 1 (for spring start students) of the second semester and *before* they complete 50% of their coursework (i.e., fifteen credit hours). Changes can be made as necessary after the iPOS has been initially approved.

[Instructions on Filing the Interactive Plan of Study \(iPOS\)](#)

Students must select courses that meet the requirements noted in the Graduate Handbook. They should consult the graduate coordinator if they have any questions. Submitting an iPOS that does not meet program requirements will delay the review process. Students who are seeking approval to have a course not listed as an approved course count towards one of their requirements should start by submitting a School of Sustainability *Petition Form*, which can be found on the SOS Graduate Community Blackboard site.

Students are encouraged to use their degree check sheet to plan out their entire coursework, discuss the plan with their faculty advisor and receive the advisor's approval and then submit the classes via the iPOS system in MyASU. Upon submission, the graduate coordinator will begin the review process.

The student's iPOS will remain in review until the graduate coordinator, the student's faculty advisor and the graduate director ensure the courses selected meet the program requirements. The graduate coordinator then approves the iPOS online, and it is routed to the Office of Graduate Education for the final review. Once the Office of Graduate Education approves the iPOS, the status changes from in review to approved. If an iPOS is rejected for any reason, at any level of review, the graduate coordinator will provide details to the student for correcting the issue.

Course and advisor changes can be made to an approved iPOS. Changes go through the same review process described above. Some changes to the iPOS may require a paper petition or an online petition within the iPOS system. Consult the graduate coordinator for questions about petitions.

An iPOS, approved by the Office of Graduate Education, must be on file before a student's thesis proposal is considered.

IMPORTANT NOTE: All student program forms, regardless of where they are processed, must first be submitted to the graduate coordinator. The graduate coordinator will make an electronic copy for the student's file and ensure that forms are routed to the correct unit for processing.

iPOS Workshop

The graduate coordinator will hold at least one iPOS workshop each semester to help students successfully submit the iPOS or changes to the iPOS. The graduate coordinator will also discuss how and when to submit a SOS petition and the Office of Graduate Education committee approval forms, which are items that should be done prior to submitting the iPOS or iPOS changes to avoid delays in the review process.

Students are encouraged to attend the iPOS workshop before submitting their iPOS for the first time and before graduation, since the iPOS must be accurate to avoid having a graduation application withdrawn by the Registrar's Office due to an iPOS with errors.

Students who are not able to attend an iPOS workshop can set up an individual advising appointment with the graduate advisor by contacting the SOS advising front desk.

Check Sheet

Until the plan of study is filed, students can track coursework requirements using the *MSUS Check Sheet* found on the SOS Graduate Community Blackboard site. The graduate coordinator will also keep track of each student's degree requirements and will keep a copy of the check sheet in the student's file. The check sheet will be used in the student's annual review. Students are encouraged to meet with the graduate coordinator to review their check sheets.

Course and Graduation Requirements

The plan of study comprises a minimum of thirty-three credit hours.

	Credit HRS
Foundational Courses	6
Core Courses	12
Methods Courses	5
Career Preparation Course	1
Track Electives	6
Culminating Experience	3
Total Semester Hours Required	33

Non-degree credit from ASU, combined with transfer from another institution, may not exceed twelve credit hours on the iPOS.

Foundational Courses (6 hours)

The foundational and core courses are designed to provide students from diverse backgrounds with method and theories for the study of sustainability. They explore the link between concepts of sustainability and systems approaches to knowledge, and develop the integrative methods and skills needed to work across the disciplines on sustainability problems. The following two courses are required of all students:

SOS 510: Perspectives on Sustainability (3) (Required for all graduate students in the first semester)

University-wide course covering perspectives and relevant theories on sustainability. Using case studies, faculty and students from engineering, architecture, humanities, business social sciences, and natural sciences exchange ideas on the major challenges involved in creating a sustainable future at local, national, and global levels.

SOS 511: Transformational Sustainability Research (3) (Required for all MSUS students in the first or second semester)

Transformational sustainability research aims at developing evidence-based solutions to real-world sustainability challenges. The course introduces a methodological framework that integrates methods from description/analysis to visioning and strategy building (from knowledge to action); addresses the specific functions, underlying assumptions, strengths, and weaknesses of sustainability research methods; familiarizes students with distinct ways of how to combine sustainability research methods for problem solving (e.g., intervention research, transition research); integrates two short training programs, one on teamwork skills, the other one on participatory research with stakeholders.

Core Courses (12 hours)

In addition to the two foundational courses, students are required to take twelve hours from the following list of additional core courses:

SOS 512: *Sustainable Resource Allocation (3)*

Microeconomic principles of resource allocation applied to environmental goods and services; external environmental effects and environmental public goods; decision-making under uncertainty; adapting to and mitigating environmental changes.

-OR-

SOS 598: *Ecological (Sustainability) Economics (3)*

Description to be posted.

-OR-

SOS 598: *Microeconomics of Behaviour (3)*

Description to be posted.

SOS 513: *Science for Sustainability (3)*

Carbon cycle; nutrient cycles; carbon and nutrients in the oceans; climate change; oxygen and ozone; solid-waste pollution; urban-air pollution.

-OR-

SOS 515 *Industrial Ecology and Design for Sustainability (3)*

Conceptual, ethical, and practical challenges in the design, manufacture, and lifecycle performance of products; environmental evaluation via materials-flow analysis and life-cycle assessment; global economic, environmental, cultural, and social aspects of competitive and functional product development and manufacture.

-OR-

CEE 598 *Life Cycle Assessment for Civil Systems (3)*

Covers fundamental and advanced concepts of the life cycle assessment (LCA) framework exploring products, services, activities, and infrastructure systems. Key concepts for system boundary selection, functional unit selection, inventorying, impact assessment, and interpretation stages are examined with a focus on energy and environmental assessment.

SOS 514: *Human Dimensions of Sustainability (3)*

Concepts and definitions of the human dimensions of sustainability; the role of attitudes and values in shaping sustainability goals, practices, and

programs; the diversity of values and socio-cultural contexts relating to sustainability; bottom-up and top-down sustainable policy development, social-data-collection methodologies.

-OR-

SOS 553: *Ecological Anthropology (3)*

Focuses on the theories and methods that environmental anthropology (EA) can bring to bear on human-environmental questions across a variety of social-ecological systems. Explores how environmental anthropologists approach these complex challenges, and considers the role of EA within larger interdisciplinary approaches for understanding development, adaptation, vulnerability, and change.

-OR-

SOS 591: *Sustainability Science: Interactions Between Human and Environmental Systems (3)*

This is a course on the core theories of sustainability science -- an emerging field of problem-driven research dealing with the interactions between human and environmental systems. The problem that motivates the course, and the field, is the challenge of sustainability: improving the well-being of present and future generations in ways that conserve the planet's life support systems over the long term.

-OR-

SOS 591: *Adaptation, Resilience and Transformation (3)*

Adaptation has emerged as a core concern of public policy and international development. While adaptation has long been a subject of academic research in the natural and social sciences, in the context of global environmental change adaptation has taken on new and different meanings. Resilience, a concept familiar in ecology, has also entered into the debate on human response to stress and disturbance. Here the concept has been used to highlight concerns about the direction of social change and the dynamics of social-ecological systems.

SOS 516: *Science, Technology, and Public Affairs (3)*

Political, economic, cultural, and moral foundations of science and technology policy and governance in democratic society.

- OR -

SOS 518: *Uncertainty and Decision Making (3)*

Explores uncertainty and its relationship to decision making, with a particular focus on the ways that science is applied in order to improve decisions. A central theme is the relationship among uncertainty, scientific prediction, and decision making, especially with regard to politically charged issues, e.g., as related to management of the environment.

SOS 517: *Sustainability & Enterprise (3)*

Examines the evolving interface between sustainability and human enterprise. Explores and reviews key fundamental concepts in the sustainability arena. Delves into specific case studies of attempts by current businesses to become "greener" and "more sustainable", Alternative enterprise models and examples of businesses that are using the current context to redefine the sustainability and enterprise interface will be also explored and discussed. Explores and applies an integrated approach to sustainability and enterprise.

SOS 570: *Fundamentals of CAS Science (3)*

Many phenomena of critical relevance to human society are dynamic systems that change over individual and evolutionary time scales, and are highly interactive, both within and between systems. That is, they are complex adaptive systems (CAS), and thus share isomorphic properties like near-decomposability, hierarchical organization, scale-free networks, self-organized criticality, and emergence. Fundamentals of CAS science explores the diverse, interdisciplinary applications of a complex adaptive systems across the social, behavioral, and life sciences.

SOS 591: *Governance for Sustainability (3)*

Governance for sustainability involves the emergence of self-governing networks that regulate actors' interactions with the goal of improving sustainability outcomes measured in terms of social and ecological performance (efficiency, equity, accountability, adaptation capacity, biodiversity, etc.).

SOS 591: *Environmental Ethics and Policy (3)*

An advanced, discussion-intensive course in applied environmental ethics and policy studies. Seminar participants will examine the ethical foundations of evolving environmental policy and management goals, including emerging issues relating to environmental valuation and the societal and scientific dimensions of formulating ecological and conservation policy on a rapidly changing planet.

-OR-

SOS 598: *Sustainability Ethics for Science and Engineering (3)*

This course uses a novel, game-based pedagogy to immerse students in the salient ethical problems of sustainability, including: environmental externalities, the Tragedy of the Commons, weak vs. strong sustainability, and intra-generational equity. Students will formulate and test moral hypotheses via on-line collaboration with multiple Universities simultaneously administering the same game modules on their campuses. Applications in climate change.

SOS 530: *International Development and Sustainability (3)*

Historical roots of the idea of development; economic theories of growth

and their implications for sustainability; interrelationship among population growth, food security, poverty, inequality, urbanization, technological change, international trade, and environmental change at local, regional, and global scales.

SOS 532: *Sustainable Urban Dynamics (3)*

Human and physical processes shaping urban ecologies and environments; human-environment interactions in the context of an urban region; effect of institutional and regulatory frameworks on the resilience and sustainability of social and urban-ecological systems; urban design, materials, transport, planning, and regulation.

SOS 533: *Sustainable Water (3)*

Hydrological, legal, political, and ecological implications of alternative water-management strategies; effect of institutional and regulatory frameworks; changes in water demand and supply due to human (population growth, economic changes) and natural (drought, climate change) factors.

SOS 534: *Sustainable Energy and Material Use (3)*

Sustainable engineering; overall energy needs and impacts; thermodynamics, heat transfer, and fluid mechanisms; atmospheric energy systems; field investigation; current and future urban energy systems.

SOS 535: *Sustainable Ecosystems (4)*

How human activities and management practices alter biodiversity, ecosystem functioning, and the provisioning of ecosystem services; use of economic and other social-science perspectives to estimate the value of ecosystem services; evaluation of options for achieving the sustainable flow of services from ecosystems.

SOS 536: *Food System Sustainability (3)*

Takes a broad view of food systems and the sustainability of such systems. Students are exposed to concepts, theory, methods and empirical analyses from diverse disciplines, including agro-ecology, agronomy, political science, agricultural economics, geography, anthropology and food and nutrition studies.

SOS 598: *Urban Ecological Systems (3)*

Deals broadly with the general topic of ecology of and in urban environments, the ecosystem in which over half the world's population lives. Covers the physical, ecological, and social environment of cities and how these spheres can be integrated to advance understanding and effective management of urban ecological systems.

SOS 598: *Sustainable Futures Studio (3)*

This course explores methods for thinking about the future and designs participatory future-oriented engagements. Focused on technology and the city, students will investigate the complex socio-technical relations

that sprout up in the city that help shape future prospects for sustainability. Through study of theoretical and practical approaches to investigate socio-technical change, this course evolves to ask critical questions about responsible innovation and civic engagement. The focal project for this course will involve engaging local citizens in deliberative exercises about the potential role of nanotechnology in transforming Phoenix.

SOS 598: *Urban Infrastructure Anatomy and Social Development (3)*

Understanding how built environment infrastructure systems interact with ecosystem services is a critical for policies and decisions directing urban sustainability. The "Urban Infrastructure Anatomy and Sustainable Development" (SOS 598) course will bring together students from several disciplines to develop a semester-long research project focused on a particular urban sustainability problem in Phoenix. During the semester, students will be given background on how infrastructure systems work and are interdependent, and will explore tools and methods for urban sustainability assessment with peers from several disciplines. As a class, students will evaluate a particular urban sustainability problem for Phoenix, interact with local policy and decision makers in developing solutions, and present their findings at the end of the semester to the ASU community.

SOS 598: *Human & Social Dimensions of Climate Change (3)*

The human dimensions research on climate change has become a central focus in the search for global action on the climate change dilemma. The seminar will draw upon the disciplines of social and natural sciences such as geography, anthropology, ecology, economics, political science, and humanities. Students working on a range of topics that explore the debate of climate change science and impacts from a vantage point of social, cultural, economic, political, and policy perspectives will certainly benefit from this seminar. To develop a more comprehensive understanding of human dimensions of climate change, the class will rely on the in-depth discussions between students and the instructor.

Note: Additional courses may be added to this list.

Methods Courses (5 hours)

Additional methods courses are required to assist students in approaches to developing solutions to sustainability challenges.

ASB 500: *Ethnographic Research Methods (3)*

Description to be posted.

NLM 565: *Grant Writing for Nonprofit Organizations (3)*

Provides practical, experiential instruction identifying grant makers, writing proposals, developing budgets, and evaluating grant proposals for the nonprofit sector. Students develop proposals based on actual,

identified needs of their partner nonprofit organization.

PUP 570: *GIS for Planners (2)*

Provides concepts of Geographic Information Systems technology and how the technology is used in planning.

PUP 573: *Survey Research and Multivariate Statistics (2)*

Methods of survey research design and primary data analysis for urban planning applications.

SOS 540: *Statistical Modeling for Sustainability(4)*

Equips students with sufficient knowledge of statistical theory and methods of applied data analysis to begin conducting empirical analyses in their domains of interest; bring students to a high level of competency in using a cutting-edge statistical software package (Stata) for data management and data analysis tasks; expose students to applications of statistical methods in the economics/policy/social science sustainability literatures in order to develop an understanding for how statistical tools are operationalized in the research world; and develop an appreciation for the careful synthesis of social and natural science theory, knowledge of data and its limitations and command of statistical tools that constitute quality empirical research.

SOS 591: *Applied Robustness Analysis in Social Ecological Systems (3)*

In this course students will learn how to use qualitative case-study comparison and analysis to understand the robustness of social ecological systems (SEs) and socio-technical systems (STs). In particular, students will engage with the Robustness Framework developed by Anderies, Janssen, and Ostrom and related tools from institutional analysis, political science, economics, and ethnography in order to study SEs/STs.

SOS 591: *Dynamic Modeling for Sustainability Science (3)*

This course addresses how to develop formal models of human-environment interactions; how to write down and analyze formal models; how to use (open source) computer software to help analyze models; and how to present your results using very powerful software. The course is very hands on and has a lab section. The course emphasizes collaborative learning using the tools students are learning to study a question/issue of their choosing. The course is focused on helping students with their research programs.

SOS 591: *Qualitative Methods for Sustainability Problems (3)*

This course introduces students to the theory and application of qualitative methods to sustainability research and practice. By the end of the course students will have defined and framed a sustainability problem and applied a range of qualitative methods to it, be able to articulate the strengths and weaknesses of these methods, and have a framework for assessing the appropriate use and evaluation of

qualitative methods.

SOS 598: *Introduction to Research Design and Methods (3)*

This class is designed to provide students with an overview of a diversity of methods currently used in sustainability research, and to help them develop the skills needed to match methods with research questions, and to critically assess the strengths and limitations any method brings to research.

SOS 598: *Life Cycle Assessment for Civil Systems (3)*

Covers fundamental and advanced concepts of the life cycle assessment (LCA) framework exploring products, services, activities, and infrastructure systems. Key concepts for system boundary selection, functional unit selection, inventorying, impact assessment, and interpretation stages are examined with a focus on energy and environmental assessment.

SOS 598: *Mathematical Concepts and Tools in Sustainability (3)*

This course will equip you with some of the mathematical concepts and tools necessary for understanding and tackling sustainability problems. These concepts and tools will be introduced in a problem-based context. It will start with a toy model of sustainability, a simple model that explores how human and natural systems interact, including the effects of time lags on stability.

SOS 598: *Survey Analysis in Sustainability(3)*

Essentials of quantitative method that include design of opinion surveys; and analysis using descriptive and inferential statistics involving but not limited to chi-square, t-test, ANOVA and simple correlation and regression. Lectures, homework, and lab with SPSS will be incorporated for analysis of both primary and secondary data.

SOS 598: *Writing Grants for Sustainability Research (1-2)*

In this class, you'll learn how to figure out what funding agencies want and how to tailor your proposal to their preferences. You'll learn how to make a compelling case that your work deserves funding. You'll have the opportunity to learn from proposals submitted by your fellow SOS grad students and reviewers; comment on those proposals. By the end of the course, you will have written a complete proposal draft proposal that you can refine for submission or use as a boilerplate for submissions to several funding sources.

Career Preparation Course (3 hours)

Students should take the following career preparation course in their third semester as some elements may assist students in preparing for their culminating experience in their fourth semester.

SOS 598: *Achieving Career Success in Sustainability (1)*

The need for sustainability-minded workers and leaders has never been more important than right now. Yet Sustainability as a career track is still very new and means different things to different people. Students in this course will be challenged to explore their own ambitions and 'personal brands', to shape their work personas, to model the behaviors and competencies that will help them build long-term career success, and to uncover the sustainability potential of any job - whether or not 'sustainability' is in the job title.

Track Electives (6 hours)

Students select a track to pursue and take six credit hours of electives from the pre-approved list of electives.

Track I: Policy and Administration

ESS 513: Institutions
PAF 503: Public Affairs
PAF 504: Public Affairs Economics
PAF 505: Public Policy Analysis
PAF 506: Public Budgeting and Finance
PAF 508: Organization Behavior
PAF 529: Organization Change & Development
PAF 530: Management of Urban Government
PAF 546: Environmental Policy and Management
PAF 591: PHX & the Art of Public Decision-Making
SOS 591: Corporate Environmental Management & Policy

Track II: Nonprofit Organization

NLM 510: Foundations in Nonprofit Management
NLM 520: Financial Management in Nonprofit Orgs
NLM 540: Human Resources in Nonprofit Orgs
NLM 550: Philanthropy: Theory and Practice
NLM 560: Leadership & Ethics in Nonprofit Orgs
NLM 562: Social Entrepreneurship

Track III: Technology and Society

SOS 504: Energy and the Built Environment
SOS 515: Industrial Ecology & Design for Sustainability
SOS 552: Advanced Earth Sys Engineering and Management
ETM 502: Regulatory Framework for Toxic & Hazardous Substances
ETM 527: Environmental/Resources Regulations Concept
FSE 501: Technology Entrepreneurship
PUP 575: Environmental Impact Assessment

Track IV: International Development

ASB 529: Culture and Political Economy
ETM 528: International Environmental Management
NLM 570: International NGOs
PUP 515: International Planning and Development
SOS 532: Sustainable Urban Dynamics
SOS 536: Food System Sustainability
TDM 570: Sustainable Tourism

Culminating Experience (3 hours)

Students should select one of the following culminating experiences. The student's faculty advisor must approve the proposed culminating experience in advance toward the end of the second semester. The Culminating Experience Proposal Form should be completed and submitted to the Graduate Coordinator. There are still many details that need to be added to the handbook, so please return in the future for updates.

SOS 584: Internship

Please refer to the Internship Handbook for details.

SOS 593: Applied Project

Details of the applied project expectation will be added.

SOS 594: Solutions Workshop

Solutions workshops provide students with experience solving real-world problems that involve multiple sustainability challenges. They are problem-based and not specifically attached to a single main theme. Solutions workshops are listed under SOS 594 and topics vary each semester. There will be an expectation to do an additional assignment above and beyond the course requirements and details about this will be added soon.

Graduation Exit Session

The graduate coordinator and events coordinator hold an information session each semester for graduate students who plan to graduate soon. These sessions are designed to help students understand all requirements for graduating on time. Students who miss university deadlines may have a delayed graduation term, resulting in having to take an additional course to maintain enrollment.

During the graduation exit session, the graduate coordinator reviews the Office of Graduate Education and SOS policies, procedures and deadlines for each type of degree offered by SOS. The events coordinator reviews procedures for the graduation ceremonies offered by the Office of Graduate Education (commencement) and SOS (convocation).

Students are encouraged to attend the graduation exit session during the semester they intend to graduate. Students may also attend a session prior to their last semester to understand the requirements earlier. It is permissible to attend the graduation exit session multiple times.

Pre-admission Credits

Pre-admission credits are classes applied toward degree completion but were taken prior to admission to the graduate program. These classes can be transfer courses from another institution or classes taken at ASU as a non-degree seeking student or as an admitted graduate student of another program.

Pre-admission credits cannot have been used toward another degree that was awarded. Students can use up to 12 credit hours of pre-admission credits. The School and the Office of Graduate Education must approve the specific courses used for pre-admission credits in order for the student to use them on the plan of study.

Pre-admission credits must meet the following requirements:

- taken at an accredited college or university
- graduate-level
- student must have obtained an "A" or "B" grade or the equivalent in the course(s)
- approved by the faculty advisor as part of the plan of study
- completed within three years of being admitted to this graduate program

The taking of courses for graduate credit as an undergraduate or non-degree student does not ensure admission to the program or acceptance of the acquired graduate credits as part of the plan of study.

The Office of Graduate Education has extensive rules regarding pre-admission credits. For complete details, consult the [ASU Graduate Policies and Procedures](#) handbook.

Time Limit

Students should complete the master's degree program within two years. Exceptions must be approved by the faculty advisor and the graduate director.

Concurrent Master's Degrees

A master's degree in sustainability may be taken concurrently with another master's degree through a specific, cooperative arrangement with another ASU department. Students must be admitted separately to each degree program. The plan of study for the MSUS in sustainability requires thirty-three credit hours. A maximum of 20 percent of the minimum total credit hours for the completion of both degrees may be common hours shared between the Plans of Study provided that the corresponding courses appear on the student's plan of study in both degree programs.

Beginning one graduate program and then adding a concurrent degree in a later semester may have consequences with regards to pre-admission credits, eligibility of sharing classes between the two programs and tuition expense of maintaining continuous enrollment in both programs until completing both degrees.

Important Milestones and Tips for Academic Success

1st Semester		
First Year	<input type="checkbox"/> Attend any Welcome activities, Camp T retreat (in fall), graduate forums, recruitment activities (in spring) and complete program surveys.	
	<input type="checkbox"/> Late Aug./ early Sept. - Hold initial meeting with faculty mentor or advisor and discuss iPOS and program goals.	
	<input type="checkbox"/> Successfully complete SOS 510 (and 511 if offered).	
	<input type="checkbox"/> Mid-semester – attend iPOS workshop and use check sheet to create a draft iPOS.	
	<input type="checkbox"/> Mid to late-semester - Line up financial resources and aid for future semesters.	
	<input type="checkbox"/> Mid to late-semester - Apply for a summer internship or study abroad program (if interested). Many internships are listed on Sustainability Connect. Meet with the Internship Coordinator prior to applying to an internship.	
	2nd Semester	
	<input type="checkbox"/> Attend any Welcome activities, Camp T retreat (in fall), graduate forums, recruitment activities (in spring) and complete program surveys.	
	<input type="checkbox"/> Establish faculty advisor before March 1 if fall start or Nov. 2 if spring start. Discuss program goals, iPOS and possible culminating experience ideas with the faculty advisor.	
	<input type="checkbox"/> Submit iPOS and Annual Review survey/ Request for Funding form by March 1 if fall start or Nov. 2 if spring start.	
<input type="checkbox"/> Mid to late-semester – Hold meeting with faculty advisor to discuss culminating experience project and end product. Submit culminating experience proposal and upon your committee chair's approval of it, submit a copy to the Graduate Coordinator.		
<input type="checkbox"/> Mid to late-semester - Line up financial resources and aid for future semesters.		
<input type="checkbox"/> Mid to late-semester - Apply for a summer internship or study abroad program (if interested). Many internships are listed on Sustainability Connect. Meet with the Internship Coordinator prior to applying to an internship.		

3rd Semester	
<input type="checkbox"/> Attend any Welcome activities, Camp T retreat (in fall), graduate forums, recruitment activities (in spring), and complete program surveys.	
<input type="checkbox"/> Enroll in SOS 598: Achieving Career Success in Sustainability	
<input type="checkbox"/> Early to mid-semester, review iPOS for accuracy; submit updates if needed.	
<input type="checkbox"/> Mid-semester, meet with faculty advisor to discuss the culminating experience proposal to make sure you have plans in place to complete it next semester.	
<input type="checkbox"/> Mid to late-semester - Line up financial resources and aid for future semesters.	
<input type="checkbox"/> Mid to late-semester - Apply for a summer internship or study abroad program (if interested). Many internships are listed on Sustainability Connect. Meet with the Internship Coordinator prior to applying to an internship.	
4th Semester	
<input type="checkbox"/> Attend any Welcome activities, Camp T retreat (in fall), graduate forums, recruitment activities (in spring), and complete program surveys.	
<input type="checkbox"/> Review iPOS for accuracy; submit updates if needed.	
<input type="checkbox"/> Meet with faculty advisor early in the semester to discuss culminating experience progress to ensure anticipated graduation date will be met.	
<input type="checkbox"/> Apply for graduation by Oct. 1 (if graduating in fall), Feb. 15 (if graduating in the spring), or Jun. 15 (if graduating in summer)	
<input type="checkbox"/> Submit Annual Review survey by March 1 if fall start or Nov. 2 if spring start.	
<input type="checkbox"/> Attend graduation exit session to review procedures for graduating on time.	
<input type="checkbox"/> Send culminating experience write-up to your advisor. Once approved, send a copy (and supporting materials, e.g., PowerPoint slides) to the Graduate Coordinator.	
<input type="checkbox"/> If participating in graduation ceremonies, respond to emails from the SOS events coordinator.	
<input type="checkbox"/> Complete alumni survey (sent by the SOS employer relations and career services specialist).	

Satisfactory Academic Progress Policy

Academic excellence is expected of students doing graduate work. Failure to adhere to the policies below may result in academic probation or a recommendation to the Office of Graduate Education for withdrawal from the degree program.

The following policies pertain to doctoral and master's programs:

- Minimum GPA: To be eligible for a degree, a graduate student must achieve a grade-point average of 3.00 or better in all courses numbered 500 and above, and in all work specifically included in the plan of study. Two different grade-point averages are computed: 1) the overall graduate grade-point average in all courses numbered 500 or higher that appear on the transcript, and 2) the grade-point average in all courses that appear on the plan of study. Students must also maintain a grade-point average of 3.00 or better in all post-baccalaureate courses at ASU.
- Incomplete Grades: Incompletes are given at the discretion of the instructor of a course and should not be expected. Students granted an incomplete should complete a contract with the instructor outlining the work required and the timeline for completion. The timeline cannot exceed one calendar year. Once coursework has been fulfilled, a grade will be assigned. If the student does not complete coursework within the period stipulated by the instructor, the student may receive an unsatisfactory or failing grade for the course. In the case that the professor gives the student the full calendar year within which to complete the course, and the course is not complete within that time, the incomplete will become permanent and the student will have to re-take the course if it is a required course. The School of Sustainability permits only two incompletes on a student's transcript at any time.
- Individual Course Grades: A grade of C is not allowed on any courses within a student's plan of study. If a student receives a C, he or she must re-take the course or seek approval from the Graduate Committee to remove the course from the plan of study.

The following policies pertain to the master's programs only:

- Time Limit for Submitting a Proposal for the Culminating Experience: Master's students should submit their culminating experience proposal before the start of their third semester, but no later than one full semester before they plan to begin their culminating experience.
- Time Limit for Completing the Master's Degree: Students should take no more than three years to complete the master's program.

Grades

The final passing grade for Research (SOS 592, 792), Applied Project (SOS 592), Practicum (SOS 580), and Reading and Conference (SOS 590, 790) is Y (satisfactory). No grade (Z or Y) is given for continuing registration (SOS 595, 795). Reading and Conference (SOS 590, 790) may be taken for a letter grade if approved by the instructor.

Performance and Annual Review

To ensure that students complete their degrees in a timely manner, get the most out of their experience at SOS, and meet requirements of the degree and School, the Graduate Committee will review student progress annually. Students who are not making satisfactory progress may be dismissed from the program, according to university regulations.

Annual Review

Annual reviews will be conducted in March (for fall start students) and November (for spring start students) of each year. The Graduate Committee and the student's faculty advisor will review the following documents when assessing students' progress:

- Check Sheet (provided by the graduate coordinator)
- Transcript (provided by the graduate coordinator)
- Comments (provided by SOS faculty)
- Updated CV or resume (provided by the student by Mar. 1 or Nov 1)
- Completed Annual Review Survey (provided by Mar. 1 or Nov 1)

The student's faculty advisor will provide to each student, in writing, the results of the annual review.

Probation Policy

A student may be placed on academic probation if:

1. The student's GPA in all courses numbered 500 and above and in all work specifically included in the plan of study falls below a 3.00;
2. The student's overall GPA for all post-baccalaureate courses taken at ASU falls below 3.00;
3. The student receives a C, D, or E, in a course on their plan of study; or
4. The student fails to complete the program within specified time guidelines and does not meet milestones specified in the graduate handbook.

Students will be notified by mail when first placed on probation and will be required to complete a Probation Agreement with their faculty advisor or the Graduate Committee. Students on probation must meet monthly with their faculty advisor or the Graduate Committee member handling their probation agreement to ensure satisfactory progression. A student placed on probation will remain on probation until performance improves and requirements have been met. Students have one semester to advance to good standing before termination is considered. The Graduate Committee will notify the student in writing when he or she advances to good standing.

A student may be recommended for withdrawal from the graduate program if:

1. The student is on academic probation because his or her GPA has fallen below 3.00 in the approved plan of study or 3.00 for all post-baccalaureate courses

taken at ASU, and the student fails to bring the GPA to required levels by the time the next nine credit hours are completed (continuing registration, research, and thesis/dissertation hours cannot be included in these nine hours);

2. The student receives a C or lower grade while on academic probation for any reason;
3. The student fails to meet milestones specified in the graduate handbook; or
4. The student fails to meet conditions stipulated in their Probation Agreement.

Students will be notified by mail if they are being recommended for withdrawal from the program.

A student may appeal any action concerning academic probation and withdrawal by petitioning the Graduate Committee within 10 business days, using the petition form found on the Graduate Community Blackboard site. Approval of petitions is not guaranteed.

Application for Graduation

Students should apply for graduation during the semester of planned graduation and no later than the date specified in the most current version of the Office of Graduate Education's [Graduation Deadlines and Procedures](#).

The Graduate Application for Graduation is through MyASU. Additional instructions on applying for [graduation](#) are online.

Tuition and Fees

Students can find information on [tuition and fees](#) online. Currently, the School of Sustainability does not have a program fee for the MSUS in Sustainability, and uses general graduate tuition and fee rates for courses with the SOS prefix.

Financial Support

Students seeking financial support should ask the graduate coordinator and faculty advisor about available research and teaching assistant opportunities. SOS will assist students in seeking financial support opportunities, but admittance into and continuation within the program is not a guarantee of funding.

Students should also visit the Office of Graduate Education's website, the SOS Graduate Community blackboard site, and other links for student funding resources:

- [The ASU Division of Graduate Studies Financial Support Office](#)
- [National Science Foundation Graduate Research Fellowship Program](#)
- [Jacob Javits Fellowships](#)

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- [U.S. EPA National Center for Environmental Research – STAR \(Science to Achieve Results\) Fellowship for Graduate Environmental Study](#)
 - [National Institutes of Health Grants](#)
 - [National Research Service Award \(NRSA\) Research Training Grants and Fellowships](#)
 - [Cornell University Graduate School Fellowship Database](#)
 - [Michigan State Information Page on Graduate Scholarships, Fellowships, and Loans](#)
 - [Federal Student Aid \(Student Loans\)](#)
 - [Working at ASU](#)

Facilities

ASU has a large and diverse graduate student body. More than 12,000 students from 140 countries choose ASU to pursue their graduate degrees. The university has excellent library and laboratory facilities, as well as outstanding computing infrastructure, all of which foster a stimulating and supportive environment for graduate education and research.

The School of Sustainability is located in [Wrigley Hall \(WGHL\)](#). Of particular interest to graduate students is the second-floor Synthesis Center, which is available to provide individual and collaborative work space to students in the SOS graduate program. There is wireless access throughout the building and a data lab with computers and printers on the second floor that is available to SOS graduate students.

Access

Graduate students who have been admitted may request 24-hour access to the second and third floors.

Reserving Conference Rooms

Graduate students may reserve the second floor conference room (WGHL 211). Reservation requests should be made to the fourth-floor receptionist.

Locker Policy

Lockers are available in the Synthesis Center on a first come, first served basis. Students will need to bring their own locks and if they are using a locker on a regular basis, they should let the graduate coordinator know which locker number they are using.

Writing Help for Graduate Students

Kathryn Kyle, the School's writing instructor and tutor, helps graduate students improve their writing skills. Individual tutoring is available M-F by appointment, and a one-credit writing seminar is offered each semester. For appointments, please email Kathryn at kkyle@asu.edu or call her at 480-965-5704. Online writing resources are available in the graduate-student section of the SOS website.

SOS Travel Grants

The School of Sustainability supports limited SOS graduate student travel to support thesis/dissertation research and to attend sustainability-related conferences and other professional-development opportunities (workshops, seminars, lectures, expos, etc.). More information can be found on the travel-grant application on the SOS Graduate Student Community Blackboard site.

SOS Faculty

A list of [School of Sustainability faculty](#) and ASU [Sustainability Scientists and Scholars](#) can be found online.

SOS Students

A list of current [School of Sustainability students](#) can be found online.

University Contacts

	Area Code (480)
ASU Switchboard	965-9011
Bookstore	965-3191
Campus Health Services	965-3346
Career Services	965-2350
Counseling and Consultation	965-6146
Disability Resource Center (DRC)	965-1234
Office of Graduate Education – Admissions	965-6113
Graduate and Professional Student Association	727-9870
Graduation Office (Registrar)	965-3256
International Student Office	965-7451
Meal Plans	965-3463
Parking and Transit Services	965-6406
Public Events (Gammage)	965-5062
Records (Academic)	965-3124
Residency	965-7712
Residential Life	965-3515
Scholarship Office	965-4845
Student Accounts	965-6301
Student Employment	965-5186
Student Financial Assistance	965-3355
Student Recreation Complex	965-8900
Sun Card Office	965-2273
Sun Devil Ticket Office	727-0000
Testing Services, University	965-7146
University Technology Office	965-6500